

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 47, No. 2

FEBRUARY 1979

FEATURED IN THIS ISSUE:

- ★ CONVERTING AN HF LINEAR TO SIX METRES
- ★ BROADLY SPEAKING — A CHEAP HF BEAM ANTENNA
- ★ AIDS TO 70 cm FM
- ★ RTTY — QUIETEN A MODEL 15 ELECTRICALLY
- ★ WIA ROLE IN SPM

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FEBRUARY 1979

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amateur radio



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COVER PHOTO

CONGRATULATORY PLAQUE

On 24th February, 1978, Graham Baker VK8GB established a first. This was a two-way contact on 2 metres with Noriteru Tajiri JH6TEW, as reported in VHF-UHF Notes in AR April and May, 1978.

The Japan Amateur Radio League was so deeply impressed with this contact that they honoured JH6TEW at the annual assembly at Kagoshima on 21st May and simultaneously struck a plaque for VK8GB, which was sent to the Federal office in Toorak to arrange a suitable pre-

sentation. This task was passed to the President of the Darwin Amateur Radio Club to execute.

The presentation was made by Senator Ted Robertson at a dinner held at the Travelodge Terrace Lounge in Darwin on Saturday, 30th September, in the presence of 43 members and their families.

The picture shows Graham receiving the plaque from the Senator, with Barry Burns VK8DI and Dick Klose VK8ZOK/NDK, President of the Club, as spectators.

Photo courtesy N.T. News Services Ltd. (see also page 42)

WIRELESS INSTITUTE OF AUSTRALIA

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VK6 — G.P.O. Box 11002, Perth, 6001.

VK7 — P.O. Box 1010, Launceston, 7250.

VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

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The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

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VK2 — QSL Bureau, C/- Hunter Branch, P.O. Terahba, N.S.W. 2284.

VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.

VK3 — Outwards QSL Bureau, Mr. R. R. Prowse, 83 Brewer Road, Bentleigh, Vic. 3204.

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VK5 — QSL Bureau, Mr. Geo. Luxon VK5RX, 203 Belair Road, Torrens Park, S.A. 5002.

VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O. Box 7319, Perth, W.A. 6001.

VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.

VK8 — QSL Bureau, C/- VK8HA, P.O. Box 1418, Darwin, N.T. 5794.

VK9, 0 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3128.

If there were no regulations controlling Radio Telecommunications inevitably a situation would arise which would be absolutely chaotic. This ensuing chaos would mean that the Radio Frequency spectrum could only be utilised in a most inefficient way.

At an international level this is what WARC 79 is all about.

In Australia the Wireless Telegraphy Act and associated Radio Regulations, amongst other things, provides for the organised use of the Radio Frequency spectrum, even though some of their aspects are outdated.

The Amateur Service, like all other services in this country, is subject to this Act and its regulations.

The last Australian Handbook for Operators of Radio Stations in the Amateur Service was published twelve years ago, and has been reprinted on many occasions. It appears that no further reprints are feasible. It is the Institute's view, which has received some official support, that the Amateur Service should be as self-regulatory as possible.

It is reasonable, for example, to state in regulations what frequencies, transmitter power, and types of emission may be used. Also regulations to protect all users, including other Amateurs, from spurious emissions and sub-standard transmissions are also desirable.

Certain other conditions, such as what type of messages a particular service might handle, are to some degree a matter of government policy.

In the framing of regulations for the Amateur Service the Institute feels strongly that they must be in a form that indicates concisely what is required, are readily remembered and in application uncomplicated.

This is particularly important as the newcomer must fully appreciate the regulations and the reasons for certain inclusions.

Again it is the Institute's view, which has been conveyed to the Department, that the Amateur Service should not be hamstrung by unnecessarily complicated regulations, particularly when a much simpler means would produce the same result.

What are the reasons which prompt governments to over-regulate in any particular area? We can all name many reasons, but in reference to the Amateur Service we believe one reason might stand out — the irresponsible use of amateur radio by some operators.

Is it right that the shortcomings of the few — and the numbers are indeed small — should penalise the many?

DAVID WARDLAW VK3ADW,

Federal President.

QSP

“OVER-REGULATION”

WIANEWS

The appeal to non-members to donate something towards the WIA costs involved with WARC 79 is producing results. In addition to actual donations received a number requested membership forms to join the Institute. A similar appeal was published in the Electronics press. Donations from non-members will be acknowledged in due course.

It is encouraging to observe that many members included a WARC donation when paying their annual dues. A list will be published as soon as possible.

Over the holiday period the Executive office had been inundated with subscriptions payments. A preliminary survey indicates that compared with previous years a greater percentage of members are paying earlier. At the same time the number of individual payments are well in excess of previous years. This is to be expected having regard to the greatly increased membership.

IF YOU HAVE NOT YET PAID YOUR 1979 DUES, PLEASE DO SO NOW TO AVOID DISAPPOINTMENTS SUCH AS THE DISCONTINUANCE OF AR — THE COMPUTER IS QUITE IMPERSONAL.

Strength in numbers is a "must" in the world of negotiations. The discussions on the new Handbook for Amateur station operations proceeded briskly. A few days before Christmas a copy of the latest revision was handed to the WIA but it was marked not for publication. The attitude of the Department appears to indicate that publication means the date when it comes from the printer and is released for general sale. If, for any reason, there is a delay in printing it, the final edition could be amended even further if circumstances require.

There are numerous amendments and concessions granted in the latest revision compared with the draft originally discussed last November. In so important a document every word counts and members will be pleased to know that every word was "counted".

REPORTS OF MEETINGS

The Publications Committee meeting on 5th December noted with regret the passing of our printer, Eric McAdam of Equity Press, earlier the same day. Disposal of the extra 1000 run of the December issue was discussed. Awards for 1978 were agreed and details appear elsewhere in this issue. The dearth of front cover photos for AR was again discussed. The Executive meeting on 13th December spent time on discussing the Handbook revisions and how best to utilise the \$3,500 received for educational purposes. No final decision was reached on the latter except the consensus of opinion is that donations of cash to clubs could possibly lead to frittering the money away. Thoughts crystallised to some extent on the production of educational aids possibly in the form of brochures, leaflets and visual aid material. A short discussion about band planning the 23 cm band ran straight into the very real problem that the amateur service is the secondary service and must avoid interference to the primary user. A month-to-month lease on the office, as required by the landlord, was approved.

Meetings of the Project Asert Committee were held on 22nd November and 18th December under the chairmanship of Bob Arnold VK3ZBB. Slow but steady progress was reported but more interest was required. By the time this appears in print recording stations in VK7, VK3 and VK5 should be operational.

WICEN

The following is the text of letter RB53/2/1 recently received from the Department —

"In confirmation of our discussions on 22 November 1978 the following revised conditions for the operation of Emergency Amateur Networks and the requirements for the conduct of practice exercises have been notified to our

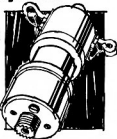
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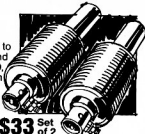
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State Superintendent for introduction on a trial basis. It is proposed that these conditions, modified where necessary, will be printed in the next edition of the Amateur Handbook.

It should be noted that practice exercises are to be considered as primarily a means of training operators in the passing and recording of messages.

1. With the approval of an authorised officer of the Department, the licensee of an amateur station may, as a member of an organisation of amateurs approved by the Department, participate in special amateur radio communications networks in times of civil emergency or disaster.
2. During a period of emergency, such networks, through a nominated co-ordinator and control station, may pass messages on behalf of the statutory authority responsible for the particular emergency (e.g. bush fire, flood, etc.). The log book of the control station shall have entered in it the name, rank, or position and telephone number of the officer of the statutory authority who requested the communications assistance, and the name and position of the Postal and Telecommunications Department officer who authorised the transmission of third party messages. (See Wireless Telegraphy Regulation 36 (3).)
3. During the period of the emergency, the licensee shall confine his transmission to those necessary for the exchange of essential traffic. Casual conversation or unnecessary calling or testing should be avoided. Any necessary testing should be conducted on a frequency separate from that used for emergency communications. Correct procedures as detailed in the Handbook should be adhered to during the emergency working.
4. Copies of messages handled by all stations in the emergency network should be retained for 12 months.

5. A licensee not participating in an actual emergency network once aware that an emergency exists should ensure any transmissions he makes do not cause interference to any stations involved in emergency communications.
6. Exercises by organisations mentioned in paragraph 1 above, to enable members to obtain practice in passing and recording messages, may be permitted, following written application to and approval by the Superintendent, Regulatory and Licensing. As a general rule the following conditions will be applied:
 - (a) Applications should reach the Superintendent at least two weeks prior to the exercise, indicating time, date, benefits expected, frequency, location, etc.;
 - (b) In any case where the exercise is to consist of providing communications for a group, the group must be either a statutory authority (fire, State emergency service, etc.) or a recognised community service group or charitable organisation (e.g. Apex, Rotary, Red Cross);
 - (c) The Amateur organisation should not be involved in press or media promotion;
 - (d) A report on the exercise as a message handling experience is to be provided to the Superintendent by the co-ordinator within two weeks, accompanied by a sample of message forms from the exercise;
 - (e) Log book of control station is to be submitted for Departmental inspection from time to time;
 - (f) Abbreviated call signs not permitted — full identification to be used by all participants; and
 - (g) The use of any specific frequency should not cause interference to other stations already in contact."

WIA 1979 SUBSCRIPTIONS

These are the 1979 subscription rates:—

	\$	Grades
VK1	21.00	All
VK2	20.00	Full
	18.00	Associate
	15.00	Student (proof required)
	10.00	Pensioner*
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VK3	23.00	Full
	20.00	Associate
	12.00	Student (proof required)
	12.00	Pensioner*
	15.80	Full Family (no AR)
	12.80	Associate Family (no AR)
VK4	20.00	Full
	18.50	Associate
	7.50	Student (proof required)
	13.00	Pensioner*
	13.00	Club (with AR)
	5.00	Club (no AR)
VK5	23.00	Full City
	20.50	Full Country and Associates
	11.50	Student (proof required)
	11.50	Pensioner*
	4.50	Family (no AR)

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MEMBERSHIP CERTIFICATES

Members, especially new members, are asked to note that membership certificates are issued free by Divisions and are signed by Divisional Presidents. No grade of membership is shown on certificates and they are valid only as long as the member remains financial.

AR AWARDS

The Publications Committee has pleasure in advising the names of the recipients of awards for the year 1978.

HIGGINBOTHAM AWARD

Mr. S. Voron VK2BVS — For general amateur radio work for publications inclusive of contributions to AR. Worth \$50.00 p.a.

TECHNICAL AWARD

Mr. Roy Hartkopf VK3AOH — Presented for the best adjudged technical contribution to AR. Worth \$25.00 p.a.

ASJA (Al Shawsmith Journalistic Award)

Mr. P. Arriens VK1PA. Worth \$15 p.a. and an engraved plaque for the best adjudged piece of amateur radio journalism in AR.

MIDLAND ZONE CONVENTION

Don't forget the Annual Convention of the Midland Zone to be held at the Strathfieldsay Hall (8 km from Bendigo, on the Epinal Road), on Sunday 25.2.78, at 10.00 a.m.

Talk-in facilities 80m, 10m, Ch. 4 FM.

Good range of equipment on display, competitions, good prizes, barbecue lunch supplied.



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Gives 40-45 dB channel separation, just add to a good quality FM receiver.

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Gain 30 dB to 20 MHz, 10 dB to 100 MHz and 5 dB to 225 MHz. Ideal to boost reception on short-wave receivers.

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Superb quality with two aerial inputs and one down lead which simultaneously supplies current from the power supply. Frequency range 40-250 MHz and 400-820 MHz. Gain 9-18 dB, depending on frequency.

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JK06 27 MHz TRANSMITTER \$29.00

JK07 DUAL TONE DECODER FOR R/C MODELS \$43.00

JK08 240 Vac LIGHT OPERATED RELAY \$20.00

JK09 SIREN KIT inc. SPEAKER \$19.00

JK10 PHOTOGRAPHIC TIMBER 240 Vac. \$23.00

JK101 BURGLAR ALARM KIT \$55.00

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AT465 LIGHT SHOW

Turn your music into light. Simply connect this 3 channel light show to the audio terminals of your amplifier and this quality kit does the rest for you!

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This superb kit drives 4 lights (400w per channel) from the audio amplifier output.

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Attractive box and knobs B3265 \$48.00

AT365 LIGHT SHOW

This quality kit uses microphone input instead of connection to the audio output. 1500w max.

Kit AT365 \$69.00

Box and knobs B3265 \$48.00

FM Transmitter

HF65 FM TRANSMITTER 60-148 MHz

Will run 5w output with heat sink. Ideal for signal testing or for a miniature transmitter which could be received on a standard FM receiver.

Kit HF65 \$9.00

Ham Converter

HF305 AMATEUR BAND 2m CONVERTER

Converts 2m FM down to the FM band 88-108 MHz.

Kit HF305 \$28.00

AM Receiver

HF61 MEDIUM WAVE RECEIVER

540-1600 KHz receiver complete with ferrite coil antenna.

Kit HF61 \$19.00

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NT415 LAB POWER SUPPLY 0-30V

1 amp well-regulated supply for professional use. Complete with box and transformer.

Kit NT415 \$128.00

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High quality supply, regulated 2-30V dc at 2 amps with overload protection. Complete with box and transformer.

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CONVERTING AN HF LINEAR TO SIX METRE OPERATION

S. Gregory VK3OT
P.O. Box 414, Hamilton 3300, Vic.

This project was brought about by the frustration of living hundreds of miles out from capital cities and being unable to alert stations occupying 6 metres of my presence.



Melbourne in particular has a very high "crud" level, generated by Channel O, with which operators have to contend; this noise tends to make intrastate communicating on 6 metres difficult to say the least. The extended ground wave paths on east-west circuits can be pushed out to over two hundred miles if good receiving equipment is used, with power levels above 100 watts to at least a four element yagi. So to those who consider any VHF power linear, please look to your receiving department first, as it is quite fruitless for an operator to read you 5 x 5 with your high power, if you have a "deaf" receiver.

There are several good low noise pre-amplifiers for both 6 and 2 metres which give an excellent lift to an ailing front end, also post converter amplifiers as featured in the early VK3 converters can add lift to the transceiver on the 10 metre band and provide a useful pre-amp. for

10 metres during non-six metre activity. At this QTH a 3N210 dual gate FET pre-amp. is incorporated into the transverter, with an RF gain facility adjusting the bias on one of the gates, whilst the post converter amplifier is a 3SK140. High power is not required for most summer sporadic E conditions. This article is for the serious long haul and back scatter, meteor scatter and forward scatter operators.

Well how do you modify a HF linear amp to the VHF 6 metre band? First, I guess, you obtain or have the necessary amplifier, which is now not so easy in Australia. I'm always being told that because the HF conditions are so good you don't need "boots" any more, so why not convert yours to 6 and convert it back when the sunspots die in a few years time? I decided to axe the station FL2100B after months of indecision, and I'll tell you after the first silver-plated capacitor

is removed it doesn't hurt a bit. I found out a few truths about construction which are hidden by the green paint and tinsel, but that's another story.

The first things to go were the PA tank circuit components, valves, RF choke, bandswitch and coils; left are the two capacitors for load and tune. The removal of all these components was achieved with very little unsoldering and a small amount of unbolting. After removing the coil assembly the ten metre tank coil, which is a separate air wound inductor, was disconnected and put to one side. For those with queasy stomachs buy a foot of 3/16 in. copper tube. The new final tank coil is about four turns of above size the same diameter as the ten metre tank but with two turns air spaced instead of one. This can readily be achieved by expanding out the ten metre coil to twice its length (you can always squeeze it back again!).

with about 24 for the 1000 pF unit, however since the PA runs in Class B Grounded Grid, it was not expected to have any regeneration in the circuit.

Unfortunately this was not to be; more on the reasons and remedies later.

The two 572B/T160 triodes were mounted back into the PA cage. A Grid Dip meter showed that the range of the tuning with the parallel tube configuration was 30-70 MHz, depending on the setting of the load and tune capacitors. The cathode circuitry was modified by removing all the bandswitching components and bypass capacitors to reveal the filament wiring and ALC circuitry.

It was found necessary to remove all of this circuitry. I did not do this initially and found that C203 of the original circuit introduced instability due to a positive feedback path through the ALC system. The driving stage should be carefully adjusted to minimise overdriving and distortion. The whole plate with all the HF coils was removed; all the capacitors whether soldered or bolted were also taken out. The filament wiring was removed due to its unbalanced configuration. A new loom was made up from heavy insulated wire, twisted equal lengths, soldered to the socket pins and returned to the bifilar RFC filament feeds.

A four turns airspaced coil wound over one inch was constructed of 18 gauge wire followed by the mounting of an Eddy-stone 100 pF silver-plated variable capacitor in the hole vacated by the bandswitch.

The coil was soldered into place and a 1000 pF coupling capacitor connected between the variable capacitor and the filament choke. See Fig. 1.

The frequency of resonance was checked with a GDO to see that it covered the required range. A fibreglass shaft coupled through to the front panel was fitted with the original band change knob. You cannot tell what changes are inside, that's for sure.

At this stage I did a little detailed reading on how to set up G-G linears and found out that you don't run drive without plate voltage applied so I left the matching of the driver till later. I fitted four capacitors from the original parts back into the cathode enclosure for bypassing the grid. Bias is applied for normal standing current, and I had to make sure that it was down to earth for RF at 6 metres. This was achieved by using two of the 250 pF and two of the 200 pF coaxial chassis mount capacitors. The two 33 ohm grid stoppers were left in but their junction was bypassed with another 1000 pF disc ceramic, C205 and C225 were changed to 1000 pF disc whilst C200 and C202 in the grids were removed and replaced with the coaxial combinations. I noticed the bias feed wire was an unshielded piece of hook-up wire so I used the shielded ALC wire to feed the cathode enclosure with the bias required. The tag-

strip containing the ALC diodes was removed and the one containing the grid stoppers and bias feed choke was altered to allow better symmetry in the layout.

I dipped the cathode coil again and then set about hooking up the transverter feed tap. With the help of Orr and Johnstone I discovered that the cathode impedance is about 150 ohms for grounded grid and that a suitable driver tapping point would be about 3/4 of the way up the input coil. With this done the rear section enclosure was boxed up to avoid coupling and possible feedback. I then set the secondary tap to the lowest position, 425V AC, which gives around 1100 volts on the anodes.

The top cover of the PA cage operates a HT interlock, so it has to be replaced before any testing is done. It also removes the temptation to prod, which is unnecessary if you've done your ground work; dangerous, too.

The first turn on showed no shorts or other gremlins, so an SWR meter was connected between the transverter and the linear amp and drive applied with HT. A check showed about 2:1, so the unit was switched off and the tap in the cathode coil accessed and moved a quarter of a turn down. Several adjustments later resulted in a 1:1 match with the loading control of the FTV650B about mid-scale (50 ohms).

Next the operate switch was pressed and the PA current idle checked at about 60 mA. Slowly a little drive was applied and the output current showed a rise to 200 mA. A bit of a fiddle with the plate tuning showed a dip and some power in the watt meter connected to the output socket. The load control gave a rise in output but reached the clockwise stop; investigation showed minimum capacity but two sections in service. One lead was snipped off leaving 250 pF across the output of the PI. A further run up showed a better figure at mid-scale for maximum output and the rest is history. The darn thing tuned up like any HF linear and was giving about 200 watts of carrier into the watt meter. Adjusting the cathode tuning cum bandswitch control gave a very lazy increase, peaking about 2/3 scale (15 metre band).

Next some two tone was supplied to the transceiver and the output viewed on a scope. It was quite clean and showed about 200W PEP on the scale — not bad for the low tap.

The medium tap gave 1700 volts to the plates at an idle of 80 mA and this with drive gave the magic numbers at two tone application 400 watts PEP on six metres for about 500 mA at 1500 volts. The regulation of the power supplies in those so-called super linears is very poor and would cause a few linearity problems in a tetrode stage.

A check on the highest tap showed only a 50 per cent power increase but considerable extra heating of the final

tubes. At 550 watts out the tubes were looking like the evening sun. On the 1700 tap with a single tone at 400 mA with the lights out the tubes were black, and that looked good for continuous service.

So there it sits on the table, a small unobtrusive box about 1/4 the size of the old 3ZAZ monstrosity with no noise and the magic numbers out on six metres.

The bandwidth of operation was good for the 500 kHz of the transceiver with out retuning, which I think is a product of the low impedance cathode circuitry.

I found that 750 watts input could be achieved from 25 watts of excitation. Efficiency was 52 per cent after subtracting the drive power, and the transformer taps were 234V AC and 620V AC respectively. The maximum DC input power achieved was a little over 800 watts in the cherry red, so as to speak, so it is recommended that SSB modes only be used with this configuration.

I ran under test at 400 PEP for lengthy periods with no ill effects or over-heating, and found out not just how much power it put out, but how clean it was.

The third order products on the analyser were the same as those of the transverter, approximately 30 dB down, which means the linear contributed nothing to degrade the products. Second harmonic was an expected 45 dB below. These tests were at full output. Remember to tune for maximum output and then reduce drive to keep within legality. Two tone tuning with a scope is the only way to correctly tune any linear amplifier, and this one is no exception. It is the only way to achieve correct loading conditions and clean operation. I have fitted a small pot to the transverter drive supply to accurately set for full 400 PEP performance and the results on air are very encouraging. The dip in PA current at peak output is very shallow and not readily noticed. Maximum output should occur at minimum plate current and, if you had a grid monitor, maximum grid current.

The antenna changeover relay leaves a lot to be desired. However, due to the facility of linear/barefoot operation at the flick of a switch, I am yet to find a suitable coaxial combination that would not be cumbersome and yet still do the trick.

All in all the project was successful and relatively cheap if you discount the cost of the linear amp. Any HF amp could be modified, it's only the layouts which present any problems. The SB200 and Dentron Superamp would also be suitable; however a bit more thought would have to go into converting the 4 tube FL200 using 6KD6s.

Eimac 8875 triodes are obviously the next choice, but after using and hearing the silence of the Yaesu fans, I would not ever tread the high speed blower path again.

If anyone blows up the tank circuit of their FL2100b I know someone who has a box of spares; see you on 6m. ■

AIDS TO 70 cm FM

Recently an article appeared in AR on VK3RAD, the 70cm repeater operating in Melbourne. This article may be looked upon as a follow-up to that article as an aid to amateurs wishing to make 70cm FM another of their modes of operation.

All 2 metre FM users may use their transceivers to form the heart of a 70 cm FM transceiver. There are three main avenues to follow and these are discussed in turn.

METHOD 1: EXISTING 10 WATT 2 METRE TRANSCIVER

By preparing a case approximately the same size as the 2 metre rig a very pleasing mobile unit can be realized. All switching and control is done via a small plug in the rear of the existing 2 metre transceiver. All DC can be switched by a small relay of conventional design but the antenna must be switched by a coaxial relay. The general arrangement is shown in Fig. 1. The 435 MHz converter can be arranged to have its output on any convenient channel, preferably one not frequently in use. Of course the transmit frequency will be 1/3rd of the desired 435 MHz frequency and the transmit crystal will have to be selected accordingly.

This system will provide approximately 4 to 6 watts at 435 MHz, depending on the varactor.

METHOD 2: EXISTING LOW POWER (HAND HELD) 2 METRE TRANSCIVER

The same method can be applied, remembering that for 1 to 3 watts on 2 metres only 1/3rd to 1 1/2 watts will be obtained on 70 cm. One amateur using this system uses a three transistor amplifier to increase the 3/4 watt output to 20 watts at 70 cm. The home-brewer could use the 2 watt exciter described in "Amateur Building Blocks" in AR October 1975.

METHOD 3: COMPLETE 435 MHz UNIT

This entails some design and quite a bit of thought but is well within the ability of any avid home constructor. Frequency multiplication is particularly troublesome and up to 200 MHz MOSFET multipliers are suggested. Avoid joining PC boards of the transmitter with coax. The transmitter should be built as one unit and not an "add on" bits.

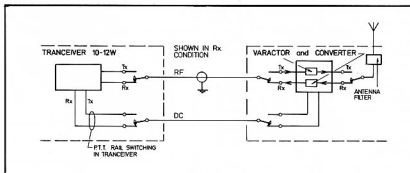


FIG. 1: Using an existing transceiver

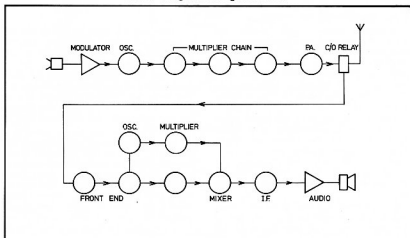


FIG. 2: 435 MHz FM Transceiver

Low noise devices for the receiver front end are of course a must. The 3N210 is a good choice. Stripline tuned circuits are most satisfactory.

The ATV converter, at present very popular in Melbourne, works very well in FM service if fitted with a source injected mixer (2N5245, TIS88, etc.) and crystal

oscillator injection chain.

This article has been kept as non-technical as possible so as not to overwhelm the newcomer to UHF. Incidentally, although only solid state systems have been discussed, a "retired" valve transceiver may usefully be pressed into service. ■

About four years ago when the bottom suddenly dropped out of the F layer, I decided something better than a G5RV was needed for consistent DX.

I turned to a rotatable 20 metre dipole. This gave better results as far as directivity was concerned but it left a lot to be desired in the way of gain. After a bit of snooping, on air and off, I decided that to attain my goal of consistent DX, beaming my signal at a low angle was essential and that either a yagi or quad was called for.

Goodness only knows how many other Hams have reached the same conclusion over the past 70 years, but so what, I wasn't around then and this I reckoned was what Amateur Radio is about today; doing something a little better for oneself, rather than thrashing off and buying an XYZ umpteen element dragpole.

Well, where to start? Quad or yagi? Aesthetically I favoured a yagi and despite strong opposition from Col VK3CO and Laury VK3AW, both fanatical quadridites, a yagi arrangement was decided upon.

It seemed fairly straight forward, but not so. By this time, DX was beginning to reappear and according to Leonardo VK3NAC, our Oracle of the F layer, not only was 20 metres going to bust right open again, but 15 and 10 were going to become the playgrounds of Novice DXers in the not too distant future.

Well, 15 and 10 were still pretty crook so I decided to concentrate on a monoband job for 20. The design was pretty straight forward drawing on what every Ham learns before he gets his ticket, and so without much ado a design rolled off the roughly cleared space on my operating desk.

Looked good, but how to feed it? Coax and balun, T-match, Delta or any one of the even more elaborate systems? My tower is over 50 metres from the RF source. 50 times \$2.00 for good low loss coax wouldn't register on my hip pocket nerve. Coax was a definite NO! What then?

Dare I remember what used to be in the dim dark days pre-coax?

"Open Wire Tuned Feeders."

Cost—minimal. Line loss—minimal. Efficiency—plus. And, after all, the majority of high power transmitters still employ them.

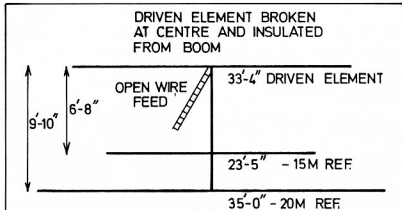


FIGURE 1: Aerial

It took about a week to get all the bits I needed together, aluminium, tube in various diameters, muffler clamps to suit, PVC insulation, nuts, bolts, and so on. Then one Saturday, after lunch, out came the hacksaw, drill, wrench and off to work. The whole job took that afternoon to complete, then up on to the pole and the last nut was tightened. Into the shack and on with the rig.

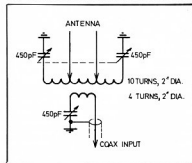
I made sure the audio was backed well off, I didn't want to hear my latest failure. Around went the aerial rotator indicator toward South America short path. This I felt would be the optimum test for my bright new home-brew two element close spaced full size 20 metre monobander because on previous wire aerials I had never even heard a South American station.

Up went the audio and after a short twist of the dial in came Rio De Janeiro at S8. Yours truly was nonplussed.

After recovering from this initial flush of success I swung the beam up over Africa and into Spain. In came EA at similar strength. Then up to France. Wherever I pointed it in came the country concerned and at extra good strength. But would it work as well both ways, receive and transmit?

It didn't take long to find the answer. Yes! Not only did it receive well but it transmitted with equal success. Many good reports were received and exchanged over the next couple of months and bulk DX was worked. VSWR was a genuine 1:1 from 14.00 to 14.35. Naturally, I was running open wire line into a matching unit—a completely tuned system.

Not like a coax-balun set-up where you establish a centre frequency then accept fall off either side and consequent reduction of efficiency. The months rolled by and I became rather blasé about the whole



business of beaming signals. Although I was enjoying good DX when all the other wire antenna men were scratching to hear over the back fence, I felt there must be more to life than 20 metres.

Remembering what VK3NAC had predicted for 15 and 10 metres, I switched from 20 to 15 one evening to see if anything was happening. Much to my surprise, Len had been right (after all, some doubt could be expected, he had been predicting a rise in the K index for the last 18 months). Europe was coming in at S4. Not as strong as 20 metres but pretty good considering my system was tuned for 20.

Well, reckoned I, if I am running a tuned system why not tune it to 15 metres? That I did and in came Europe at S6. Not bad, but still not as good as 20 metres and the beam width was rather broad.

Next day at work I joined heads with Col VK3LO on the subject and between us we decided the driven element was acting like an extended zepp on 15 metres and that any directivity on this band was not due to the 20 metre reflector which was too far back from the driven element. After a bit of snooping on 15 and hearing VK3NAC and his QRP novice mates working 15 metre DX at the same strength as my 300 watts I decided modification to the now semi-duo-bander was needed.

Up went a 15 metre reflector 0.15 of a wavelength from the driven element and up with it came the signal strength I was looking for. In fact, that night I worked two countries I had never heard on 20. If what Len had predicted for 15 was now materializing, how then was 10 metres going?

Just to make sure the beam was OK

on 10 I arranged a sked with Laury VK3AW, who was running a full wave loop on 10. After extensive checks we decided the 15 metre reflector was close enough to the driven element to give me good forward gain and a very good front to back ratio but, alas and alas, 10 was still in pretty poor shape.

So, now I had made what started out as a monobander into an extremely efficient tribander and at a great saving in legal tender. All up cost was only \$45. It had very good forward gains on 20, 15 and 10, and a 1:1 VSWR right across each band.

Although this aerial is not really for those with a small flat, it does sound real sweet and when it's about 15 metres in the air it doesn't really look too bad—to a Ham anyway!

QUIETEN A MODEL 15 — ELECTRICALLY!

(Reprinted from AARTG RTTY Newsletter No. 8,
May 1975)

Barry Ross VK6IF
42 Mayflower Cres., Craigie, 6025

If you were to ask most amateurs with Model 15s how to quieten one they probably say to take it as far away as possible, preferably down the bottom of the garden. But that is acoustic noise and if you know how to cure that many amateurs would like to know! A Model 15 with a governed motor also produces a lot of electrical noise too, capable of blotting out DX. This article is on how to reduce, if not eliminate, this noise.

The source of most noise is the governor contacts which are breaking the voltage to the motor. This causes a spark and if we can remove this spark then we remove the noise. If we replace the contacts with an SCR and use the governor contacts to gate the SCR using a low voltage then we eliminate the sparks!

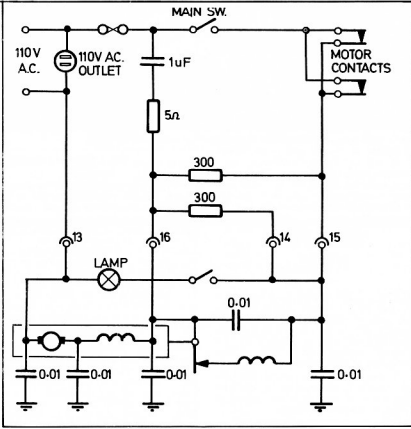


FIG. 1: Original Circuit Diagram of Teletype 15 Motor System

The type of SCR is not important providing that it is of adequate ratings which are at least 125 volts at 1 amp. I used a C106B1 and it is around this type of SCR the article is written. The gate resistor may need to be experimented with to get another type SCR to fire reliably.

It is necessary to remove the base bottom cover to gain access to the wiring

and resistors leading to the motor. This can be awkward due to the weight of the Model 15 so remove the typing unit by unscrewing the 3 or 4 large flat headed screws on either side of the machine. This will allow you to turn the base upside down and remove the bottom cover.

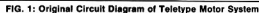
In the middle of the base are two large resistors with 5 wires connected to them.

Well, that's the whole modification. It also works on Creed 7B, too, and stops most of the noise on that machine, too. It has worked for some time on both my



The clatter of the machine you will just have to live with!!! ■

AND REPORTING SAME TO
THE INTRUDER WATCH
CO-ORDINATOR?



ROYAL NAVAL AMATEUR RADIO SOCIETY

Don Walmsley G3HZL
153 Worples Road, Isleworth, Middx., TW7HT

SHORT HISTORY AND DETAILS OF OUR INVOLVEMENT WITH THE MUSEUM SHIP HMS BELFAST

The Royal Naval Amateur Radio Society (RNARS) was formed in 1960, mainly along the lines of the other service amateur radio societies but to attract the naval amateurs. The senior service was a little late on the scene, although the Navy had had many radio amateurs in its ranks, both before World War Two and after; all it needed was the driving force.

That was supplied by the few that gathered at HMS Mercury, the RN Signal School, in August 1960, prime movers being George Tagg G8IX, Mike Matthews G3JFF, John Pegler G3ENI, G3LIK, G3DOT, etc. Yours truly was not there, being unfit at the time, but on the Society's inauguration in October 1960, I became number 12 on the books. There were only 58 of us in those days but with lots of hard work and many outside activities designed to attract members, we have grown until we have a strength around the 700 mark. Amongst our founder members was one Australian, VK3CDR, then Surgeon Captain, now Rear Admiral Jim Lloyd, reasonably well known, I believe to the members of WIA.

The RNARS has been involved with many outside activities, in the early years mainly from the RSGB Amateur Radio Exhibitions held in London. These were always supported until lack of serving members and stringent cutback in public funds caused us to abandon them for the time being; one day we hope the climate improves and once again permits us to appear at these events. We also support Portsmouth Navy Days in August, run a mobile rally in June from HMS Mercury, support Jamboree on the Air from HMS Mercury and since 1973 we have operated a station on board HMS Belfast, the preserved cruiser, moored in the River Thames, between London bridge and Tower bridge. GB3RN is the call we try to use from all these locations and except for 1977 we have succeeded — our licensing authority suspended the use of GB calls throughout 1977.

The first involvement with HMS Belfast began in 1973, when it was decided to do something special for the RSGB's Diamond Jubilee. We applied to the Trust that looks after the ship for permission to set up and



HMS Belfast by Tower Bridge, London.

operate an amateur radio station aboard the ship. This was granted, and in the first week of September we descended on the ship and established a station on the Admiral's bridge. This was very much enjoyed by us and provided good publicity, so it was decided to repeat it again in 1974; the date was moved to August so that it would coincide with school holidays, but when we approached the ship's authorities, they said that we could no longer use the Admiral's bridge. Alternative accommodation for the station was suggested, we were shown a dark, dusty room on the same deck and this suited our purpose even better; they had shown us to the old bridge wireless office, much more roomy and a thousand times more suitable. Another very successful week's operation took place and before we packed up, it was decided to call a meeting of the London membership to see if we could restore the office to something resembling its condition at the ship's last refit in 1956. Work started on this chore in the winter of that year, much scrounging taking place to acquire equipment, painting, cleaning, rewiring and installing, being brought to a reasonable state by 1976. Our committee decided that the activity period should be moved to Easter of 1975, because we were trying to do too much during the summer months and this is now the fixed date, from Good Friday for ten days each year.

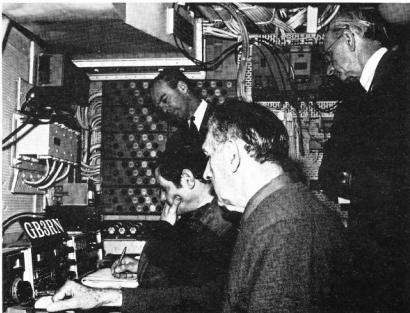
During the 1976 Easter activity, the BWO was officially opened to the public by Cap-

tain Derek O'Reilly, Captain of Signal School and, although we cannot provide a full time staff, the display has been there for the public to view. The London group were issued with the call G4EOK in November 1975 and we are active with this on most week-ends of the year.

Many overseas amateurs visit the ship during their stay in the UK, and Mavis VK3KS and Ivor VK3XB have been entertained aboard.

The small group of London members are still working on restoration jobs, mainly consisting of rewiring and finding ways to route the various antennas into the shack, existing 90 ohm naval coax not being suitable for our purposes and except for the trap dipole which still enters via a voice pipe, all antennas now enter the BWO via the original feed points. Some of the old naval whips are used for reception, and the VHF antennas are an excellent match on 144 and 432. We have installed a 270 ft. end fed which works extremely well on 1.8 MHz (still looking for a VK or ZL to complete WAC on that band). Main transmissions take place on the trap dipole and a 12AVQ has been donated to us and it is hoped that this will be installed soon. This antenna should improve our ten metre performance.

Activity took place at Easter 1977 but we had to use G4EOK, G3HZL and G3XRN to cover our three operating positions, a bit disappointing not having GB3RN and



Main HF operating position of GB3RN. (Photo courtesy Petty Officer P. J. Walker — Defence Press Office).

rather a struggle to make contacts, but, hooray, in late 1977 the Home Office announced that GB calls would be available this year, so application put in early and there we were at Easter using the lovely call Great Britain 3 Royal Navy again.

The preparations for the event start in the middle of December when the first publicity letters start to be written, then down to the ones asking for volunteers and loan of gear, etc. Response this year was reasonable. On the 23rd the first volunteers start to come aboard, usually serving members who are going to stay aboard for the full ten day stint. No official accommodation aboard, but there are ten bunks that we can use in one of the old Petty Officers' messes and full use are made of these during our activity. First signals were radiated exactly at midnight local time and the DX was soon rolling in and it continued to do so throughout the week, except for Monday, when conditions were rather disturbed and we concentrated on 80 metres. Over 2000 contacts were made during the period in 103 different countries, amongst them being many VKs and ZLs, plus HC8, VP8 (Signy), PJ, HI, JW, VU, SU, HR, YN, C5ZC4, PY, JA, CN8, HP, KZ5, YV, KH6, VP9, 9L1, EL, LU, HK, ZS, ZS3, 4X4, EP, ST, YB7, HM, 8P6, VP2V, CO, CX, 5Z4, VS6, OX, HZ, J3, 9N1, KP4, 9G1, ZD7, FM, TI, VP2L, most of the countries in the USSR and plenty in Europe; no deliberate attempt was made to chase DX, we just let it come and find us. Most contacts were conducted on a chat basis, excepting for a short spell in which we handed out a few points in the CQ WPX SB contest.

Many stations want to chat when they hear our location, so our apologies to those stations who got fed up waiting for us, and I guess that there were very many.

Our big day was on Friday, 31st March, when our President, Captain John Taint, RN, honoured us with a visit; the usual naval bull took place on Thursday evening (that's why we were not too active then) in readiness for the morrow. Other guests were expected, and the first to arrive was Lord George Wallace of Coslany, immediate past President of RSGB. Ten minutes after he showed up the Captain arrived, to be greeted by a motley side party. They were conducted up to BWO; I had to return to the quarterdeck to greet Dr. Fred Horner, Director of the Appleton Laboratories (G3RRS is the club at that establishment and many of the VPs heard from the rare Antarctic islands come there), and Dr. Dain Evans, President of RSGB. After an hour or so inspecting the station and chatting to our members, the guests plus a number of us adjourned to the ship's club bar (not on the public rounds) and had a few welcome wets. Many of the overseas amateurs who have met me on board have seen the inside of the club and they are usually made very welcome by the ship's staff. The visit of these distinguished persons went off very well and they all expressed themselves satisfied with what we had achieved in the BWO.

Sixty members participated directly in this year's activity, ranging from a 13-year-old sea cadet to Reg G3EGJ, who joined the Royal Navy in 1913. Serving members have to wear uniform during this activity, because it classes as an official duty, and

we had from a Lt. RN and Lt. RM down to RO (Steve Wilkshire of the Ark Royal) taking an active part. Many members were also contacted, VP8PL on Signy, ZC4IO, Dusty VK3AYO, ZS1JJ, G3ZGC/MM, etc. All in all, a very successful and enjoyable ten days were spent aboard, some of us never seeing our homes between the 23rd March and the 2nd April. Although very enjoyable it is nice when it finishes and you can once again enjoy the comfort of your own bed, instead of sleeping in a naval bunk.

The activity should take place between the 13th and 22nd of April next, and we are hoping that conditions will be even better so allowing us to contact even more overseas stations.

Corporate membership of the RNARS is open to serving or past members of the RN, RM, WRNS, Reserves, Commonwealth Navies, RNXS, RFA service, Sea Cadet Corps or those connected with these services in a civilian capacity, or serving or past members of UK or Commonwealth Merchant Navies; yearly subscription is £2.00. Associate membership is open to serving or past members of foreign navies, including Merchant Marine or those connected with these services in a civilian capacity.

The Society also issues the Mercury award for working RNARS members; DX only needs 5 points, but the award will be endorsed for each extra 10 points gained, and there are band and mode endorsements, log data only, and £0.30 or its equivalent to G3HZL. The Hampshire County Award is also sponsored, the award is on a points basis — one point gained for each station contacted within the county boundaries, 2 points for G3BZU or any other sponsored RNARS special event station, as long as it is within Hampshire. This award is in three classes:

Class 1 — UK 50 points, EU 20 points, DX 15 points.

Class 2 — UK 30 points, EU 15 points, DX 10 points.

Class 3 — UK 20 points, EU 10 points, DX 5 points.

Log data to G2MG, cost as Mercury award. All contacts for both these awards must have taken place after the 1st October, 1960.

A Morse proficiency certificate is also issued for 100 per cent copy at 15, 20, 25, 30, 35 and 40 w.p.m. The transmissions take place on the first Tuesday of each month from G3BZU at 2000 local on 3515 (plus or minus QRM); trifle difficult for our Antipodean friends, but it is believed that our large group in ZL are planning something similar, negative late news on this one.

All enquiries regarding the Society to the Secretary, HQ Station, G3BZU, HMS Mercury, East Moon, Petersfield, Hampshire, GU32 1HE, or to the author, G3HZL, 153 Worple Road, Isleworth, Middlesex, TW7 7HT. ■

WOOMERA'S CONTRIBUTION TO THE 21st JAMBOREE-ON-THE-AIR

Woomera's participation in the 21st Scout and Guide Jamboree-on-the-air during October '78 was a highly successful event.

Although the number of contacts was not many, quality rather than quantity is the aim of this International activity.

Altogether nine Brownies, 12 Guides, nine Cubs and 11 Scouts, and a number of leaders and others spoke from 10.50 a.m. on Saturday to 6.30 p.m. on Sunday to 21 of many special jamboree amateur radio stations, with only a few hours off during a period when the bands went dead.

Many stations were heard, using young Scouters with CB experience as assistant operators, and their performance was of high standard.

In Woomera, the 40, 20 and 15-metre amateur bands were used, with a "listening watch" kept on 80 and 10 metres to see if contacts there were available.

The station used was that of Richard Ashton VK5DQ who for the past three years was the SA Scout HQ Commissioner for Radio and who briefly acted as Woomera Scout Leader earlier this year.

TXCR LOANED

A standby transceiver was loaned by the Woomera Amateur Radio Club in case of station equipment failure; fortunately this did not happen, but it was useful in a contact with a New Zealand station in which Woomera had to transmit on one frequency and receive on another due to so many other stations being on air.

The station was "open for business" for 22½ hours, of which about 13½ hours were spent talking to contacts at home and abroad, and the rest in looking for and waiting for stations the youngsters could understand.

Altogether three stations were contacted in New Zealand, Tasmania, Victoria, Australian Capital Territory, South Australia, Western Australia and Queensland contacts totalled 17, and also one at Umtali

Derived from a report in the "Gibber-Gebber",

Woomera — 26.10.78.

Submitted by Dick Ashton VK5DR

(Rhodesia) where the Scouts had originally intended to camp on the golf course but this was cancelled, owing to their vulnerability to terrorist attack.

Many Japanese and American stations were heard but as most were only wanting to swap contact cards and were not Jamboree stations, time was not wasted trying to contact them.

RHODESIA

A Rhodesian station was contacted after waiting half an hour while six other stations talked on non Jamboree business and when contact was finally made, band conditions deteriorated and forced a break off after only five minutes.

Interest was such that of the 41 young people who attended, a number came back as often as four times, making the actual attendance 64!

Some had taken part previously in regular Sunday morning contacts with two other Adelaide Scout radio stations, at Para Vista and Tea Tree Gully, and this activity will be continuing in preparation for next year's Jamboree-on-the-Air. ■

L. to r.: Angela Marlow, Jeffrey Delgado, Leslie Evans, Dick Ashton VK5DR, Boyd Roberts.



NOVICE NOTES

ADJUSTABLE TUNING OF "SKYBAND" 80 METRE WHIPS

Gordon J. A. Cassidy VK2NCW

The 80 metre helically-wound "Skyband" whips, 6 ft. long, available commercially in Sydney (VK2ZXL), have a bandwidth of about 50 kHz between points with SWR of 2.

It is possible to change the resonant frequency by loading the whip externally with a short piece of copper or aluminium tubing slipped over the upper part. The rough measurements I have carried out show that the resonant frequency can be set anywhere in the novice part of the band without noticeable change in the bandwidth or minimum SWR, by adjusting the distance of the loading sleeve down from the top of the whip. No measurements were made of the extra losses introduced, but these are not expected to be high.

In these tests, a piece of 3/4 inch copper light-gauge water supply tubing about 3 inches long was slipped over the top of the whip and held in position with a piece of 2 mm nylon sleeving looped through it.

Measurements were made at intervals of 20 kHz over the novice band, for several positions of the sleeve, and the SWR and reflection coefficient plotted. If the top of the sleeve is about 5 inches down from the top of the whip, the resonant frequency is unchanged, while moving it further down increases the frequency, a movement of about 15 inches being needed to move from one end of the novice band sector to the other. The minimum SWR was less than 1.1 in all positions.

It should be possible to construct a remotely tuneable version by mounting nylon pulleys at the top and bottom of the whip and moving the sleeve with nylon fishing line.

RIP — LETHAL SEQUEL

I dreamed death came the other night
And Heaven's gate swung wide
With kindly grace an angel came
And ushered me inside
And there to my astonishment
Stood folks I'd known on earth
Some I had judged unfit
And of very little worth
Indignant words rose on my lips
But never were set free . . .
For every face showed a stunned surprise
No one expected me!

Credit — ARNS Bulletin July 1978.

CORROSIVE CRUNCH

Photos 1 and 2 show Kevin VK2BKG's TA33 senior beam which was supported 70 ft. above the ground on a self-supporting tower, which found its way to the ground one windy night.

Take special note of the mounting plate which corroded away, the plate was aluminium and the bolts were stainless steel. The tower stayed in place, only the beam came down.

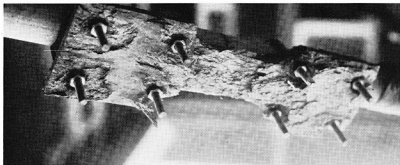


PHOTO No. 1

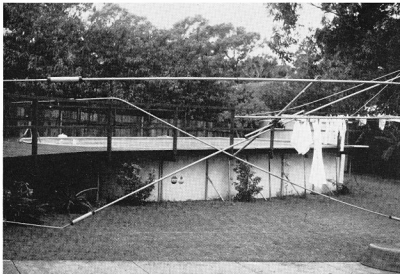


PHOTO No. 2

QSP

CHURCHILL FELLOWSHIPS

The Winston Churchill Memorial Trust will be calling for applications for Churchill Fellowships, tentable in 1980. The closing date is 28-2-79. There are no prescribed qualifications for the award of a Fellowship, merit is the primary test, whether based on past achievement or demonstrated ability for future achievement. The value of an applicant's work to the community and the extent to which it will be enhanced by the applicant's overseas study project are important criteria in selecting Fellows. Fellows are awarded a return economy class overseas air ticket and an overseas living allowance to enable them to undertake their approved overseas study project. Fifty-nine Churchill Fellowships were awarded for 1979 at a total cost of \$300,000. The Trust was established in 1965 from the capital sum subscribed by the Australian community in memory of Sir Winston Churchill. Funds now stand at \$5.7m. Australians over 18 years of age, from any walk of life, who wish to be considered for a 1980 Churchill Fellowship should write for a copy of the

brochure and application forms to the Winston Churchill Memorial Trust, PO Box 478, Canberra City, ACT 2601.

NEW PREFIX 1979

To mark the celebrations of the 1,000th year of Tynwald — the Isle of Man Parliament — the prefix GT may be used by amateur operators on the Island from 30th June to 8th July, 1979. Other UK prefix changes are, of course, GU for Guernsey and GJ for Jersey in the Channel Islands in place of the GC prefix.

REPEATER CHANNEL SPACING

"Despite considerable discussion," quotes Radio Communication of September 1978, the VHF Committee of the RSGB in relation to 2m repeaters, said "it was agreed not to introduce 12.5 kHz spacing on repeaters yet, but builders of repeaters are being advised to use equipment capable of being converted to this standard in the future."

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Application	SSB Transmit	SSB Receive	AM	AM	FM	CW RTTY	CW RTTY
Number of Filter Crystals	5	8	8	8	8	4	8
Bandwidth (6 dB down)	2.5 kHz	2.4 kHz	3.75 kHz	5.0 kHz	12.0 kHz	0.5 kHz	0.5 kHz
Passband Ripple	< 1 dB	< 2 dB	< 2 dB	< 2 dB	< 2 dB	< 1 dB	< 0.5 dB
Insertion Loss	< 3 dB	< 3.5 dB	< 3.5 dB	< 3.5 dB	< 3.0 dB	< 5 dB	< 6.5 dB
Input-Output Termination	Z _i 500 Ω C _i 30 pF	500 Ω 30 pF	500 Ω 30 pF	500 Ω 30 pF	1200 Ω 30 pF	500 Ω 30 pF	500 Ω 30 pF
Shape Factor	(6:50 dB) 1:7 (6:80 dB) 2:2	(6:60 dB) 1:8 (6:80 dB) 2:2	(6:60 dB) 1:8 (6:80 dB) 2:2	(6:60 dB) 1:8 (6:80 dB) 2:2	(6:60 dB) 1:8 (6:80 dB) 2:3	(6:40 dB) 2:5 (6:60 dB) 4:4	(6:60 dB) 2:2 (6:80 dB) 4:0
Ultimate Attenuation	> 45 dB	> 100 dB	> 100 dB	> 100 dB	> 90 dB	> 90 dB	> 90 dB
Price	\$40-65	\$55-10	\$59-30	\$59-30	\$59-30	\$41-50	\$73-45

In order to simplify matching, the input and output of the filters comprise tuned differential transformers with the "common" connections internally connected to the metal case.

Registration Fee: **\$3.00**; Air Mail: 31c per 1/2 oz. Shipping weights: Filters 2 oz. ea. Crystals 1/2 oz. ea. All Prices in U.S. Dollars.

Matching Oscillator Crystals

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XF902 LSB 9001.5 kHz \$4.75
XF903 BFO 8999.0 kHz \$4.75
F-06 Crystal Socket (HC25/u) \$5.00

Oscillator Crystals 50 kHz through 150 MHz available by order. Parallel resonant (30 pF) to 20 MHz series resonant above 20 MHz. Write for quotation for your requirements (include mechanical size & frequency).

Matching FM Crystals Discriminators for XF-9E

Freq. Dev.	Slope	Price
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XD-9-02 - 10 kHz	-24 mV/kHz	\$27-80
XD-9-03 - 12 kHz	-50 mV/kHz	\$27-80

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SKY. 20 14.150
SKY. 15 21.100 and up.
SKY. 10 28.5 and up.

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SKY 20 6 feet long 14.150 \$26
SKY 15 6 feet long 21.100 \$25
SKY 10 6 feet long 28.500 \$24
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AMATEUR RADIO WEEK-END

The WIA Education Service, incorporating the Youth Radio Service, concluded another successful amateur radio week-end of fun and learning.

PHOTO No. 1

At the mike we have Rex Black VK2YA, founder of the YRCS in Australia, receiving a 160 metre call back. Next to Rex we have Br. Cyril Quinlan, the Co-ordinator of the amateur week-end concept, and next to him (holding the switch for the 1.8 MHz linear) is Mathew VK2NAI.

PHOTO No. 2

Steven Rowilson at the controls of a mini-computer—one of the new popular additions to the amateur week-end activities.

PHOTO No. 3

Steve Rowilson's father having a nice time trying the do it yourself electronics training kit.

PHOTO No. 4

From right to left we have Bruce VK2NUT, Christ VK2NYA, Mathew VK2NAI, and Paul VK2NYO (holding the mike) manning the HF 160 to 10 metre station.

The cost for all accommodation and food at the Katoomba happening is \$20 (or \$12 if you are ten years old or younger). If you would like to get into the next week-end (beginners, students and licence holders are all welcome), please contact:—

Ken Jarne VK2NWK, (02) 638 1687.
Cel Wyn Carlyle VK2NOK, (02) 827 3589.
Les Dickenson VK2NMY/YMY, (02) 47 3044, for further details.

FIELD TRIP TO HILLEND NEAR BATHURST, N.S.W.

The Amateur and Citizens Radio Club of NSW is organising an Amateur and CB radio week-end at Hillend, near Bathurst, on the week-end of the 17th February.

Any amateurs who would like to participate in demonstrating and discussing the ins and outs of the fun of amateur activities would be most welcome to attend.

A private bus is being hired to transport those leaving from Sydney if you require transport for you and your gear. The bus will be set up for all bands, so we will be able to work the world while "bus mobile".

All are welcome to attend and newcomers are especially welcome to come along. For details and reservations contact Max Lowe, 30 Frances Road, Putney, NSW 2122, or phone 807 6172, or call in on the club net on the first Saturday of each month on 3580 kHz plus/minus QRM or any Sunday at 8.30 p.m. on 28.5 MHz.

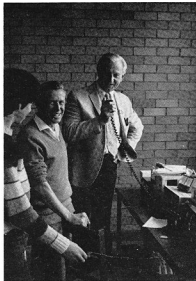


PHOTO No. 1



PHOTO No. 2



PHOTO No. 3



PHOTO No. 4

NOVICE NOTES

SOLID STATE RIGS

Whether you grieve for tube finals or not, Solid State finals are here to stay and will increase in the years ahead. The problems of making efficient transfer of the RF energy to antenna systems are more acute with solid state than with tube finals with their loading controls. Mobile operation in particular is demanding and ensuring a perfect match to the base of the antenna is imperative. Some of the problems you can have occur are: (1) High VSWR of around 3:1 will reduce useful power output. (2) RF voltages resulting from VSWR appear on the chassis and microphone and sets exhibit symptoms of RF feedback. Remember that broadband solid state finals have no loading controls to approximate optimum impedance of 50 ohms. Therefore we suggest that you take particular care in matching your feedline to the antenna. Mobile antennae have base impedances lower than 50 ohms and it is suggested that the impedance be checked with a bridge and resulting discrepancies be corrected with a base matching unit. Transceivers used in the shack should use a tuning unit if only to reduce tendencies for TVI. Beams, etc., may have a feedline impedance of 50 ohms, but don't depend on it as variations in assembly and proximity to nearby objects may modify this.

POWER METERS AND HARMONICS

10 watts on your power meter may not be "watt" it seems! If you have harmonic output, the harmonics may combine with the fundamental to produce erroneous readings on some power meters. Fortunately most rigs have low harmonic output and the reading is accurate but watch out for this pitfall.

From VICOM Ham News.

THE KILLARNEY HEIGHTS NOVICE RADIO CLUB

160 METRE LOGGINGS FOR 1978

Equipment: A Forest phone FP-1, 160 metre transceiver crystal locked on 1.825, 10 watts, AM, AWA make, fully transistorised, a McLeod ME58/11A, 160 metre transceiver crystal locked on 1.825, transmitting, variable on receive, 18.00 to 18.60 valve. Antenna: A 160 metre dipole, 125 feet.

VK1 — VK1RK.

VK2 — VK2HO, BIC, BVS, BGH, GE, IQ, BZK, LS, ACC, BAV, AAB, BDT, BWS, BRU, BSB, BJL, LH, OO, BFR, WC, OI, APO, PA, BOJ, ARN, BGV, BPX, BYO, BZJ, BKK, DI.

VK3 — VK3ALS, IM, BEX, AOS, ACA, AAB, AEI, DW, BIE, BI, AXE, DO, LO, EV.

VK4 — VK4DJ, RJ, MR, MD, AFH, ZQ, AAL, AHO, RH, AJM.

VK5 — VK5KL, ALB, NN, XI, MG, AS, EJ.
VK6 — VK6TQ, 6AF, 6AS.
VK7 — VK7LZ, AE.
ZL — ZL4AY, 2LA, 2AGY, 1AVA, 2BLR,
2HE, 2AA, 2BC.
VR — VR4DX.

Who said that 160 metres was not active?
When was the last time you called on
1.825? ■

R. C. Black VK2YA
N.S.W. Education Officer

TRIAL NOVICE EXAMINATION — OCTOBER 1978 INTRODUCTION

Following the custom started in 1975, Trial Noveice Examinations were conducted on and about 28th October to suit the situations in various participating Clubs and courses. These tests provided the "last chance" for instructors and students to ascertain the strengths and weaknesses of Radio Theory and Regulations knowledge and Morse Code skills prior to the official Noveice examinations of the Post and Telecommunications Department, held on 21st November.

With immediate marking of candidates' Trial papers, there was time for instructors to revise and drill the weak points revealed by the Trial Noveice "probing".

Letters were sent to as many NSW Radio Clubs as possible, inviting them to participate in the Trial Noveice operation. Response was disappointing. However Examination Centres were organised at Perth, Adelaide, Darwin, Parkes, Canberra, Gosford, Lismore, Inverell, Cambridge Park, Springwood, Buxton, Lithgow, Killarney Heights, Liverpool, Newcastle Technical College, Wagga, Westlakes, Pennant Hills, Noosa, Cranbourne.

ORGANISATION

Wherever possible Clubs were asked to nominate independent Examination Supervisors who received the examination papers and kept them in safe custody until the times for examination sessions.

Morse Code Receiving tests were put out to cassettes and distributed to Supervisors, who were required to secure the services of competent amateur operators to mark the tests and to administer Morse Sending examinations.

Candidates were able to take their question papers away from the Centres for discussion of their efforts with instructors and fellow candidates. In short, the papers became "Revision Syllabuses" in the three weeks between Trial and P/T examinations.

Examination results were returned to the Education Officer to permit the assessments and statistical information.

EXAMINER'S COMMENTS

CW Receiving

70 per cent of candidates passed in BOTH Receiving and Sending at 5 w.p.m. and reports indicate that a goodly number have used the Education Service's "Learning Morse Code" Course and the Practice Cassette system.

CW Sending

23 per cent of candidates failed or did not attempt the Sending Test.

Regulations

80 per cent of candidates passed in this subject, which was set on the P/T format of 30 multiple-choice questions. One private study candidate from Lithgow gained possible marks; the lowest mark was 4 out of 30.

Theory

The Departmental November Noveice Examination in Theory would be the FIRST set to the newly-introduced P/T Noveice Syllabus and to the WIA Noveice Study Guide. Therefore, no previous P/T papers would offer adequate guidelines as to what our candidates might expect on 21st November. We had no means of knowing where the Departmental examiners might distribute their "probing" and what might be their "pet" topics. What emphasis they might place on certain aspects of the new Syllabus and the depth of knowledge they might require. It was considered necessary — or even urgent — to test the new Syllabus as widely as possible — even if it became necessary to change the timing and the format.

A disturbing trend was noticed with respect to the P/T Noveice Examination last May. Some Noveice students, having completed less than HALF of their Course, were able to attempt the P/T testing and to gain 70 per cent of possible marks on elementary topics and some reasonably intelligent guessing of the multi-choice questions. Keeping in mind that a Noveice licence is, in fact, a TRANSMITTING PERMIT, there can be no justification in framing theory papers which make it possible for candidates to pass without adequate training and testing in the "transmitting" areas of the Noveice Syllabus. For this reason the Trial Theory paper was divided into three sections with the requirement that candidates must pass in all three sections. Furthermore, the section C was weighted to 50 per cent of the possible marks, emphasising the EXAM WORTHINESS of questions relating to transmission, propagation, aerials, transmitters, frequency measurement, TVI, BC1, harmonics in which areas Noveice candidates should be well drilled, even if they are not taught and tested on "the composition of solder" and similar unessentials.

There was a wide range of marks in this Theory area. Top mark was 84 per cent; lowest mark was 8 per cent. Average mark was 53. The results gave a reasonable approximation to a "normal distribution graph". In short, candidates who had been well taught and had made an adequate effort did quite well. Those who were ill-prepared or "took it too cheaply" or "gave it a go just to please the instructor" did not achieve satisfactory levels.

NOVICE EXAM SYLLABUS

It seems that some instructors did not know of the existence of the new P/T Noveice Syllabus and the WIA Noveice Study

Guide. Obviously, many candidates were similarly unaware of these guidelines.

After the first few batches of material came back from Examination Centres, I made up a PROGRESS ANALYSIS and distributed to Clubs and instructors to show the trends and weaknesses revealed. Some instructors made very good use of this information and "hammered" the weak topics — hopefully in time to meet the P/T Noveice deadline. However, some candidates were so backward that it would have been impossible to "build them up" to satisfactory standard by 21st November.

Mr. Reg Stockman of Inverell has suggested that in the April Trial Noveice there should be TWO Trial Theory papers set so that the first (a longer Diagnostic test covering the whole Syllabus) should be given about 4 or 5 weeks prior to the P/T Examination in May; the second should be JUST BEFORE the P/T Examination and should be in P/T format. Another suggestion is that Clubs should be allowed to choose whether to submit candidates for a simulated P/T Examination OR for a longer Diagnostic test which can then be used as a "final burst" Revision Syllabus.

However, I suggest that Club instructors would do well to follow the YRS Radio Certificate sequences, keeping in mind that Elementary (Stage 1) approximates to the "Basics" topics of the P/T Syllabus; Elementary (Stage 2) would take students through Receivers up to Superheterodyne Receivers. Also, the YRS Certificates in Radio Telephony and Wireless Telegraphy offer useful practical applications of much of the Theory topics.

An undue proportion of students failed in Sections A and B of the Theory paper. These related to topics that would have been covered in the early weeks of a Noveice Course. One suspects that in some cases the Trial would have been the first time many students would have been tested during their training period.

It has been suggested that some candidates who "knew their Radio" were "thrown" by the use of question types that were other than multi-choice. I do not subscribe to this opinion. Assuming that instructors DID, in fact, conduct progress tests during the Course, it is improbable that ALL such tests were multi-choice. A candidate who MUST have four alternative answers presented to him and is incapable of deriving an answer by other means looks like a rather unpromising future member of the Amateur Service!

I point out, too, that mature students are masters of the art of deluding instructors into assuming that they (students) have grasped the complex principles of Radio Theory. An instructor who accepts the nodding of heads as an indication of "grasping" is certainly deluding himself! ONLY complete and repetitive testing can assure him that his students have definitely understood and learned.

Some of the candidates' papers make one doubt whether they have ever seen an Amateur Radio Station; have even handled

a transmitter to tune and adjust it; have ever examined the "entrails" of a simple Superhet Receiver to locate the various stages. How many have ever used a Frequency Meter or a Wavemeter or seen a CRO display of over-modulation? In short, I think that many Novices are being let loose on the Amateur bands without adequate experience and background. How many have ever been "on the air" from an Amateur Station UNDER SUPERVISION? To achieve these desirable aims I suggest that Club members in general — those NOT undertaking the important, and unpopular, functions of instructing — might do well to contribute time and interest as members of Committees to provide the practical experience necessary to make GOOD CLUB NOVICES. In USSR, for example, there are Club Committees which provide such experience for candidates before the relevant Department issues transmitting licences. Our Australian Novices would benefit greatly from a similar set-up.

WHAT LESSONS HAVE WE LEARNED FROM THE TRIAL NOVICE EXAMINATIONS?

- (A) That the whole Trial Novice exercise should be FLEXIBLE to meet the needs of Clubs and Courses, each of which has a different set of situations to determine its needs;
- (B) Clubs and Courses should arrange Trial Novice examinations with sufficient time between Trials and P/T examinations to permit thorough revision of weak topics;
- (C) Novice Courses should be based on COMPLETE coverage of the P/T Novice Syllabus and the WIA Novice Study Guide;
- (D) Instructors should be encouraged to use the advantages of the YRS Radio Certificate system to offer step-by-step incentives to students;
- (E) Clubs and Courses should be conducted with provision for students to gain equipment handling experience relevant to topics taught;
- (F) Trial Theory Examinations should be available in:
 - (i) P/T format and

Geoff Swift VK2NCJ/YGE

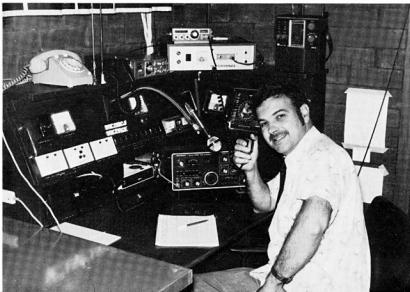
"RADIO ROOM" OR "SHACK"

Here is a photo of my recently completed "Radio Room". I don't call it a "Shack" because I put too much work into it!! As can be seen the design idea was to have everything at fingertip control. It features, in console type arrangement, an AC line monitor meter, master switch, RF field strength meter, SWR and power meter, internal and external temperature meter, 24-hour world time clock, a phone patch

board, 12 illuminated rocker switches, 6 x 240V power outlets, boom mic., digital clock, cassette recorder, mic. pre-amp, VK Powermate, 2 x light dimmers and flashing LEDs for quick action in case of power or faults causing losses.

The main transmitters are a Uniden 2020 for HF and a Kyokuto 2 metre transceiver for VHF work.

To add a touch of luxury the "Radio Room" is air-conditioned and fully carpeted.



- (ii) other formats as may be considered more suitable for assessing candidates' knowledge of Syllabus topics;
- (G) Trial Theory Examinations should be arranged on the "Three Sections" basis to obviate the chance of inadequately prepared candidates gaining pass marks;
- (H) All Instructors and Students should be encouraged to have P/T Syllabi and WIA Novice Study Guides in their possession;
- (I) Radio Clubs and Courses should undertake the function of awarding prizes to their successful Trial Novice candidates;
- (J) Arrangements should be made for Trial Novice Examinations AT ANY TIME as requested by Radio Clubs;
- (K) Trial Novice Theory papers should give special attention to the important topics of TVI, BCI, interference in general and remedies;
- (L) Instructors should conduct Morse Code instruction on the basis of NORMAL style, BUT sufficient practice should be given in the ITU mode to ensure that candidates at P/T Morse Tests will not be disconcerted by the different style of Morse used;
- (M) The practice of awarding Intermediate and Junior Certificates on the present basis to Trial Novice candidates should be continued.

GERALDTON AMATEUR RADIO GROUP

For many years Geraldton sported only two hams, Jack VK6EJ and Noel VK6MF. During the past year membership has increased to include seven full calls, three limited calls, and three novice calls, including a YL, Moira VK6NDM, and our State's youngest ham, Glenn VK6NGK,

who is twelve years old.

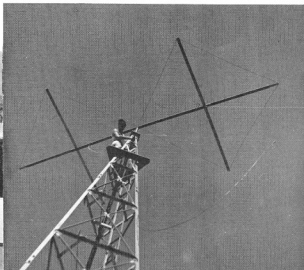
We have a very active radio group, having established a Repeater from which pre-licensing tests have been most gratifying, with frequent contacts to Perth (400 km), Bunbury (500 km) and Cape Leeuwin (600 km).

We have organised two successful fox hunts and various social activities, enthusiastically supported by hams and their families — and this within twelve months. Jack Cowles VK6EJ.

(see photos over page)



VK6MF attempts to locate the fox (in a fox hole?)



VK6QA Keith, sporting a 20 Mx bow tie.

THE AMATEUR RADIO CLUB OF TONGA (ARCOT)

Harry Feldman A35HF

Just two years ago there were no hams in Tonga. When Bill Lang came from New Zealand to work at the Tonga Copra Board he brought his hobby along with him. The Tonga Telephone and Telegraph Commission (T&T) issued him a courtesy licence and he went on the air as A35WL. Not one to be satisfied to enjoy ham radio alone, Bill soon gathered a small group of interested Tongans and palangis which began meeting weekly as ARCOT.

Bill Rickertson began giving a course in radio fundamentals which Don Greer A35DE, a Peace Corps Volunteer working as a technician at T & T, later took over. After a term, when it became apparent that the facilities at the University of the South Pacific's Nuku'alofa Center were inadequate, ARCOT found a new home at 'Atenisi University. Don's course continued to arouse a great deal of interest among 'Atenisi students and the community at large and drew about 25 students. After one term at 'Atenisi, four of the class's members passed T & T's 12 w.p.m. code test and the exam in electronics and radio law. Stone Maille A35SM, 'Etuete Kavana A35EK, Puono Taula'eteau A35PT and Harry Feldman A35HF were the first ever to be licensed in Tonga by examination.

More recently two other T & T employees, Villami Vaka'uta and Stone Kava 'Aloua, got the licences A35VV and A35SK. After the second term of Don's course Sam Kolokihakaufisi got the licence A35SF.

Meanwhile, Don, Stone Maille, 'Etuete, and Harry put together a shack in the back room of 'Atenisi's lab using an antique Eddystone model 750-x that T & T had lent us and a Knight T-60 that a friend in New Zealand donated. The Club station, A35FI, has been on the air since July and we have had many pleasant QSOs with our friends around the Pacific with the Eddystone, the T-60 and an inverted vee.

Early in 1978, Clark Richardson A35CR, became interested in forming a liaison between T & T and the amateur community that might result in some clarification of Tonga's 1934 Radio Law. At the same time, T & T was taken aback at the unprecedented rush for licences. They were concerned that improperly trained amateurs might interfere with other services. The series of meetings that Clark organized with Henry Mailu, Acting Superintendent of T & T, culminated in Henry's approval of the Club. He was particularly interested in the potential of a group of self trained communicators for alternative communication in time of emergency. Dave Goddard A35DG was the first to communicate with the outside world during the destructive earthquake of June 1977.

In September and October of this year all the members met to approve our new constitution and to elect officers. Dave, as his last action as outgoing president, sent a copy of the constitution to the IARU as part of our application for membership. Our new president, Tavake Vi A35TV, is the very first Tongan ham. Don was elected vice-president, Villami the secretary-

treasurer, and Ric Berger A35RB, the property officer.

ARCOT has received recognition from Tonga's Legislative Assembly as the official representative of amateur radio in the Kingdom. The Crown Prince, Tupouto'a, has shown an interest in the Club and has agreed to open A35FI officially.

Our plans for the future include continuing classes next year and starting a branch of the Club on the Northern Island group of Vava'u, with the aim of organizing an emergency communication network. We are also hoping to get a USAID grant to install solar powered transceivers in the medical dispensaries in outlying villages to give them an opportunity to consult with the main clinic in Nuku'alofa.

We should be able to make great progress toward our objectives if we can only overcome one or two little problems. One of these is the 1200 miles of Pacific that lie between us and our neighbourhood Radio Shack. Thus far we've been relying mostly on parts cannibalized from old transistor radios. We'd like to express our gratitude to Ric Berger, N4TN, W7OZ, K6AGD, W4NBP, the North Shore ARC in New Zealand, the Flyweight DX Club, the Santa Clara County DX Club, and many others for their words of encouragement and offers of help.

N4TN is acting as QSL manager for A35E EK, FI, HF, PT, SF, SK, SM and VV. You can hear A35E EK, HF and SM operating A35FI between 7004 and 7017 kHz most days between 0800 and 1200Z. Other hams operating in Tonga are A35S CR, DE, HU, RB, TV and WL.

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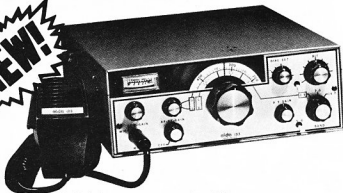
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Sensitivity:
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Image Ratio:
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(typical with respect to 0.5 µV input; 80 metres — -130 dB; 40 metres — -100 dB; 20 m — -75 dB).

IF Rejection:
Better than -70 dB
(typical with respect to 0.5 µV input; 80 metres — -110 dB; 40 m — 90 dB; 20 m — 75 dB)

Intermodulation Intercept Point:
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THE WIA ROLE IN THE "SPECIAL PREPARATORY MEETING"

Michael J. Owen VK3KI

This report on the Special Preparatory Meeting (SPM) is of particular interest to Australian Amateurs. The paper submitted by Australia was based on the work of a number of Amateurs, in particular, Jack O'Shannassy VK3SP and Earl Russell VK3BER. Considerable support and assistance was afforded by officers of the Postal and Telecommunications Department. In addition, valuable suggestions and comments were afforded by a number of prominent overseas Amateurs. The Institute acknowledges their work with gratitude. The preparation of the paper was co-ordinated by Michael Owen VK3KI.

The WIA was asked to provide a Delegate with special responsibility for the Amateur Service on the Australian Delegation. David Wardlaw VK3ADW was a member of the Australian Delegation for the first two weeks of the SPM, and Michael Owen VK3KI for the remaining two weeks. The cost of their travel and accommodation was borne by the WIA.

In the second week of the SPM, the

IARU held a reception for leaders of Delegations and members of Delegations who were also Amateurs. More than 150 Delegates attended this reception. Amongst these were many, from Asia and Africa, including representatives of the People's Republic of China. This was the first occasion on which representatives of China attended an IARU function.

The recommendation of the SPM affecting the Amateur Service will provide an important basis for the Service's position at the WARC.

However, and very importantly, the significance of the SPM conclusions should be kept in perspective. The SPM was confined to a consideration of technical matters—it was not a frequency allocation conference. In addition to technical matters, the WARC will be concerned with far wider considerations, including economic, political and social issues. But on the other hand, the first and essential step, the acceptance of the technical basis for the Amateur position, has been taken.

The SPM was an essential step in the ultimate resolution of the WARC, but cannot be regarded as an end in itself. The

conflicting claims of different Services for radio spectrum will only be decided at the WARC. The needs and requirements of different countries and different Services for frequency are diverse and conflicting. The Amateur Service must continue to press its case strongly, though in a balanced and sensible way.

The WIA, therefore, faces a heavy and continuing commitment over the next year, both financially and in the allocation of its resources.

The response of clubs, members, non-members and industry to the Institute's appeal for funds will determine how much more the Institute can do in fulfilling its fundamental responsibility to represent Australian Amateurs during this most important year. ■

SPECIAL PREPARATORY MEETING OF CCIR

Michael J. Owen VK3KI

Between the 23rd October and 17th November, 1978, the International Radio Consultative Committee (CCIR) held a Special Preparatory Meeting (SPM).

ITU Special Preparatory Meeting, First Plenary, CCIR 23.10.78 — WIA Federal President is seated with the Australian delegation working for WIA members and other Australian amateurs.



The task of the SPM, as defined by the Administrative Council of the International Telecommunications Union was to prepare a report based on texts approved by the XIVth Plenary Assembly of the CCIR, as well as on new contributions submitted to the SPM by Administrations and other participants. The report of the SPM was to be comprehensive and self-contained, and was to be presented in a form consistent with the various agenda items of the World Administrative Radio Conference 1979, and was to consist of technical information and conclusions considered by the SPM to be of importance to the work of the WARC. The report is being distributed as a document of the 1979 WARC and is not available to the public. It was not the task of the SPM to make specific proposals for revised or new allocations.

750 people (not including ITU representatives) participated in the Conference from 85 countries, 30 recognised operating agencies, 15 international organisations (including the International Amateur Radio Union), 10 scientific and industrial organisations, and three United Nations specialised agencies. Prior to the start of the SPM, some 400 documents were sent to the Delegates participating in the meeting.

Dr. J. A. Saxton of the United Kingdom was appointed Chairman of the SPM by the XIVth Plenary Assembly of the CCIR. The technical topics around which the work of the SPM was organised were as follows:—

- A. Terminology and classification and designation of emissions. Chairman, Dr. M. Joachim (Czechoslovakia).
- B. Terrestrial services up to 40 GHz, technical data for allocation and regulations. Chairman, Mr. C. Terzani (Italy).
- C. Space services and space/terrestrial sharing up to 40 GHz, technical data for allocation and regulations. Chairman, Mr. E. Craig (Australia).
- D. Monitoring and identification. Chairman, Mr. H. Kaji (Japan).
- E. Services above 40 GHz, and optimum use of the spectrum. Chairman, Mr. H. Willenberg (Federal Republic of Germany).
- F. Propagation. Chairman, Dr. F. Horner (United Kingdom).
- G. Resolutions and Recommendations related to CCIR work. Chairman, Mr. T. de Haas (United States).
- H. Drafting. Chairman, Mr. M. Thue (France).

368 new contributions were submitted by Administrations and four of these concerned new questions relating to the Amateur Service and the Amateur Satellite Service. Australia, Canada and the United States submitted new papers dealing with preferred bands for the Amateur Service and the United States also submitted a paper dealing with the Amateur Satellite Service.

The Australian contribution paid particular attention to the bands below 30 MHz. It was directed to investigating an optimum basis for the efficient allocation of spectrum to ensure the operational effectiveness of the Service. It examined the family of frequencies allocated to the Aeronautical Mobile (R) Service, the Broadcasting Service and the Maritime Mobile Service. It pointed out that the particular needs of these Services were met by the allocation of a suitable family of frequencies. It further pointed out that the allocation of harmonically related bands was formally recognised at the 1927 ITU Washington Conference. However, it argued that the need for harmonically related allocations no longer exist. It also argued that the wide spacing between successive bands had caused unacceptable crowding of these bands. Annexed to the Australian contribution was a computer study that illustrated the increase in communication capability over three particular paths if bands at 10, 18 and 24 MHz were allocated to the Amateur Service in addition to the existing allocations. The study took into account varying propagation and seasonal conditions. It illustrated that the provision of a new band at 10 MHz would provide a major improvement.

The Australian contribution also contended that sharing with radiolocation in the VHF and higher bands was feasible and would provide access to wider and more useful bands, though it was desirable to preserve some exclusive allocations for particular Amateur experimentation throughout the spectrum.

The contribution of Canada referred to the extent of use of Amateur bands and also illustrated the improvement in reliability in communication on three east-west paths by the addition of a new band at 10 MHz and argued, as did the US paper, for an enlargement of the family of frequencies available for the Amateur Service in HF bands.

The Amateur Service and the Amateur Satellite Service were considered in Committees B and C. Initially the Conference was divided into a large number of sub-working groups and working groups which reported to the main Committees. The documents circulated to Delegates before the SPM were considered and subject papers produced, which were eventually considered by a Plenary Meeting. Each paper went through a three-stage process before finally appearing as a "pink" document. These documents, as approved by the SPM, will constitute the report of the SPM.

The IARU participated in the SPM as a full delegation, and actively took part in discussions involving the Amateur Service. The IARU Delegation included Merle Glunt W3OKN, Roy Stevens G2BYN, and David Sumner K1ZZ.

David Wardlaw VK3ADW and Michael Owen VK3KI served on the Australian Delegation with special responsibilities for

Amateur Radio matters. In addition, there were more than 50 Radio Amateurs who formed part of national Delegations.

What were the important conclusions of the SPM affecting the Amateur Service?

In the context of allocations of frequencies up to 30 MHz, the SPM referred to the fact that frequency dependent factors determine the effectiveness of radio communications in the Amateur Service, and also pointed out that Amateur station operators continue to contribute to the knowledge of radio propagation phenomena, as well as the development and demonstration of spectrum conservation techniques throughout the radio frequency spectrum. The SPM concluded that frequencies in the MF band are useful to allow investigation into, and use of, propagation peculiar to this band, particularly during a sunspot minimum when the MUF is below 3 MHz. The SPM also concluded that the communication capability of the Amateur Service would be significantly enhanced by a better distribution of the frequencies available to it below 30 MHz. A suitable family of frequencies with narrower spacing between successive bands than is at present the case would have some technical advantage. The SPM also concluded, significantly, that it is not necessary to preserve a harmonic relationship between all of these bands. The SPM included in its report the computer study annexed to the Australian contribution, and the table annexed to the Canadian contribution.

The SPM also gave consideration to the allocation of frequencies above 30 MHz and in this part of its report the SPM referred to the definition of the Amateur Service in the Radio Regulations and also noted that "the number of Amateur stations, world-wide, is now more than 1,000,000 and is growing at an annual rate approaching 20 per cent". It suggested that above 30 MHz, frequency bands common to the three Regions are desirable. It also concluded that access to bands distributed throughout the spectrum is desirable to enable the Amateur to become experienced with those problems which are peculiar to different parts of the spectrum, such as the various modes of propagation, the problems of signal generation and detection, and antenna design. It again pointed out that Amateur bands no longer are required to be harmonically related. It also pointed out that it is desirable that bands allocated to the Amateur Service are sufficiently wide to permit experiments with wide band techniques. It also concluded that the Amateur Service could share frequency bands with the Radiolocation Service, permitting broader band operation than would be possible with narrower exclusive allocations. The report of the SPM further said: "Such sharing would not require the Radiolocation Service to provide protection to the Amateur Service which would not be feasible, but even with this constraint, useful exploitation is possible by the Amateur Service."

Exclusive allocations, where possible, would help to meet particular needs of the Amateur Service." The SUM annexed a summary of the characteristics of the preferred bands above 30 MHz.

Whilst the SPM was able to reach a conclusion as to the feasibility of the Amateur Service sharing with Radiolocation in bands above 30 MHz, the SPM decided that there was no data on which to base a technical conclusion of the sharing possibilities between the Amateur and other Services below 30 MHz.

The one question that had previously been under consideration in CCIR affecting the Amateur Satellite Service was the question of the technical feasibility of frequency sharing by that Service. The SPM referred to the existing CCIR reports on this topic and concluded it was technically feasible to use existing world-wide Amateur Services frequencies in the earth-to-space direction in the Amateur Satellite Service under the same limitations that now exist for their terrestrial use in the Amateur Service. It also concluded that it would be technically permissible to utilize in the space-to-earth direction those frequencies which are allocated exclusively to the Amateur Service on a world-wide basis. The SPM further concluded: "Additionally, subject to the provision of 6362(1567A) of the Radio Regulations and also appropriate PFD limitations, it would appear to be feasible to use frequencies in the bands 1215-1300, 2300-2450, 5650-5670 and 10475-10500 MHz in the space-to-earth direction."

Two other references to the Amateur Service that will be contained in the report of the SPM are of interest and indicate a real awareness of the particular nature of the Amateur Service. In the context of the chapter dealing with questions involving propagation, the observation is made that "it is assumed that there is little interest in circuits which provide effective communication for small percentages of the time, except possible by the Amateur Service, in which the use of relatively poor circuits presents an interesting challenge". In the context of frequency tolerances, the SPM reported "no tolerance values have been established for meteorological aids, nor for the Amateur Service. This matter can best be handled by national Regulations."

Writing to the IARU Region 1 Division WARC 1979 No. 10 (December, 1978), Roy Stevens said "After the SPM had concluded, it is possible to say that the meeting assumed an importance greater than was originally envisaged. Many Delegates at the SPM will also be present at the WARC and decisions taken at the SPM will have a considerable influence on the work of the WARC."

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The Editor,
Dear Sir,

Congratulations on another annual December bumper issue of excellent quality. I refer now to my article on "TVI Filters — The High Pass Type", which appeared in that issue. Whilst I agree that your comments at the end of my article are correct in a general way, the anonymous authors' filters were also designed for the same impedance lines, namely 300 and 75 ohm, and if designed for Australian conditions should have also been designed to have no attenuation above 45 MHz.

One point that perhaps I did not make clear was that the selection of component values was done by building a number of prototypes around the nominal values obtained by calculation, to achieve maximum attenuation below 45 MHz with minimum attenuation above 45 MHz. Some filters had excessive insertion loss and were discarded as totally unsatisfactory. Some filters had good attenuation below 45 MHz but also had 3 to 5 dB of attenuation throughout the passband. The final filters which were described in the article had at worst 1 dB of attenuation over about 50 units made. It took many hours to obtain the optimum component values to give maximum attenuation, deepest notch and minimum insertion loss.

A large number of high pass filters are available on the market for about \$2.50 and are usually made to the circuit in Fig. 1A of the December 1978 article. These filters have a wide production spread with various degrees of insertion loss and are designed with the American market in mind where the lowest TV channel in use commences from 54 MHz, therefore in most instances Channel 0 in Australia gets a bit of a pasting if signals are at all weak.

I mentioned that one popular colour TV set did not respond to the use of high pass filters in the aerial circuit in the article. The TV set concerned is a Pye using a particular tuner. The tuner is reputed to be a Taiwanese Oak tuner, other sets using either of the two alternative types of tuner appear to respond favourably to routine TVI cures.

After considerable experimentation it was found that the AGC line to the grounded base RF stage of the tuner was inadequately filtered for RF, and HF signals very easily got into the tuner via this path. The cure in this case was to place a 15k ohm resistor with the AGC terminal on the outside of the tuner, and then readjust the AGC control in the TV set for minimum interference. Cases of intolerable interference became curable. Some of these sets also had the coaxial balun omitted

from the 300/75 ohm changeover network. It was also found that the aerial system must be in first class condition otherwise interference is still likely to occur.

Hope these points assist those troubled with apparently unsolvable interference.

73. Rodney Champness VK3UG. ■

Electrical Engineering Department
Swinburne College of Technology
Hawthorn, Vic. 3122
5th January, 1979.

The Editor,
Dear Sir,

I found the article on "Optical Communication for the Amateur" by Chris Long in your January 1979 issue most interesting.

As someone who has had a small amount of professional experience and a great deal of interest in this subject for almost twelve years now, I would like to offer some comments to highlight a few characteristics which could have received a little more emphasis in Chris Long's article. I would also like to mention some widely available, relatively more comprehensive, readable and more recent reference books in this field.

The more recent optical communication systems are solid state systems. They are simpler and hence more easily constructed, smaller, and therefore more portable, more efficient from an energy consumption viewpoint, and perhaps more importantly have wider bandwidth and better signal to noise ratio than the vacuum tube systems described at length by Chris Long.

Assuming that a signal to noise ratio of 20 dB is acceptable for copying voice communications and that the input signal to noise ratio seldom exceeds 50 dB, it is evident that 30 to 40 dB of signal degradation with respect to noise is all that can be tolerated in the transmission system before signal copying becomes rather difficult. A light drizzle or a moderate fog is all that is needed to introduce over 100 dB of signal attenuation over distances as short as 100 metres. It is only when there is very clear atmospheric conditions over the entire path length that less than 30 to 40 dB signal degradation with respect to noise can be achieved.

Although Bell Telephone Laboratories, The Australian Telecommunications Research Laboratories, NEC Research Laboratories in Japan and others have had successful solid state optical links operational over ten or more years ago, the unreliability of such links due to attenuation wipe out by rain and fog has forced them to divert research effort into guided optical transmission through optical fibres.

Atmospheric or unguided optical communications systems nowadays almost always use solid state GaAs (or some other semi-conductor) light emitting diodes for transmitting. GaAs avalanche mode photodetector diodes are used for receiving.

The light intensity transmitted is almost directly proportional to the current through the transmitting diode and the current generated in the receiving diode is almost directly proportional to the light falling on the receiving diode.

The physical theory of receiving and transmitting devices is explained at considerable depth in such text books as —

Yariv, A.: "Introduction to Optical Electronics", Holt, Rinehart and Winston Inc., NY, 1971.

Moss, T. S., Burrell, G.J., and Ellis, B.: "Semiconductor Optoelectronics", Butterworths, London, 1973.

Circuits to drive the transmitting diodes have been published in simple books such as —

Mims, F. M.: "Light Emitting Diodes, LED, Circuits and Projects", Howard Sams, Indianapolis, USA, 1972.

Markus, J.: "Electronic Circuits Manual", McGraw Hill, NY, 1971.

Circuits to amplify the received signals are given in most standard books on electronic circuits as well as in specialised well written books such as —

Texas Instruments Staff: "Optoelectronics: Theory and Practice", McGraw Hill, NY, 1977.

Mims, F. M.: "Light-Beam Communications", Howard Sams, Indianapolis, USA, 1975.

As a part of Electronic Design project work, Electronic Engineering third year students at Swinburne College of Technology in Hawthorn have designed, constructed and tested circuits which are small enough to fit into Single Lens Reflex camera bodies which have had photodiodes mounted on the optical axis at the focal plane at the back of the camera.

Parts for transmit and receive circuits, including suitable photodiodes, have cost less than \$50. Two medium aperture 35 mm SLRs with defective shutters have cost less than \$40. The test link at Swinburne at its best so far has had a 40 dB S/N ratio for a 10 kHz bandwidth over the length of a 50 foot corridor in the Electrical Engineering Department. With design improvements I believe it should be possible to achieve a video bandwidth at about 40 dB S/N over about 1 km.

It is worth noting that the total light output and the beam light energy flux density are less than 1 per cent of those from common four D cell hand-held torch lights.

Because of the unreliability of such systems due to attenuation by atmospheric precipitates, it is unlikely to be used by commercial or governmental bodies to any significant extent in the foreseeable future, even though the technology has in fact been available for quite some time.

Because of the very high directionality of beams, line of sight infra-red links could be used for normal TV communication between two amateur stations with only a very small likelihood of interference

to or detection by anyone else engaged in much the same type of activity.

All those who use large bill boards and flashing lights to broadcast information across many kilometres from tall buildings are already using the optical band for communication purposes.

People with hearing and speech handicaps use the optical communication channel as the most important channel of communication. Lip readers often violate privacy laws using the optical communication channel.

It would therefore be interesting to see how telecommunications authorities formulate rules to govern optical communication. Until any serious conflicts of interest can be predicted reasonably accurately, telecommunications authorities are not likely to prevent amateurs and others from conducting research into optical communication.

Yours faithfully,
Dayal Abeyasekera,
M.Sc., Ph.D., M.I.E. Aust.

AFTERTHOUGHTS

ADDITIONAL MODIFICATION TO THE FT100B — November 1978, p. 15.

The link across the two diodes in Fig. 1 should be omitted.

A SIMPLE AND ECONOMICAL \$80 METRE RECEIVER

Due to a technical fault, the PCB on page 24 of December AR did not reproduce properly. We have printed it again for those who may have run into trouble.

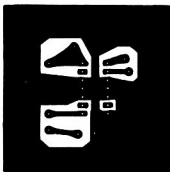


FIG. 2: Audio Board

AN ACTIVE DX RECEIVING ANTENNA November 1978, p. 15.

Here is some additional information for constructors of this circuit.

The transistor Q1 in Fig. 2 may be a 2N3819 or similar RF FET with good gain.

In Fig. 2 Q2 in the breadboard constructed by the author was a 2N3638. Any PNP RF amplifier should be suitable, particularly those with good high signal capability and low noise figure. Other suitable types include 2N4122, 2N4917, etc.

The author wishes to apologise most sincerely to those people who wrote requesting this information and were incorrectly given a list of NPN transistors such as 2N3563, 2N3866, etc. Apparently the author suffered an attack of temporary imbecility.

The RFCs should be 1 mH or so. A single pi wound coil RFC of 1 mH has been available through various common component retailers. The reactance should be more than 500 ohms over the whole frequency range of interest.

When the circuit in Fig. 3 is set up, R must be adjusted so that Q2 draws a useful collector current. Voltages taken from one unit are as follows: Source of Q1 (the junction of the 820 and 8.2k ohm resistors connects to this), plus 2.5V. Source of Q3, plus 2.5V. Collector of Q2, plus 6.5V. All voltages were measured from ground with a 20k ohm per volt voltmeter. The voltage across R was 0.6V. R consisted of a 200 ohm potentiometer in series with a 100 ohm resistor. The supply voltage was varied from 10 to 15V — only a small effect on any of the above voltages was noted.

A tantalum capacitor of 4.7 uF or so may be necessary across the supply rail to prevent oscillation.

Note that if the gain is considered inadequate it may be increased by bypassing the 820 ohm resistor with a 0.1 uF capacitor. An RFC may also be placed in series with the 8.2k ohm resistor to increase the gain further.

The circuit is most successful with antennae less than 0.05 to 0.1 wavelength long at the highest frequency of use. A CB whip is too long except for frequencies less than say 10 MHz. An L network would be better for matching a CB whip.

Antennae 0.1 wavelength and longer will provide sufficient match to 50 ohm coax for the amplifier to be of marginal use. The presence of strong broadcast stations will also make the use of a longer antenna unwise as strong cross-modulated "birdies" will appear at the low end of the HF spectrum.

Beware of shunt capacitance — either due to layout or that inherent in some components. This will cause the gain to fall off rapidly at the higher frequencies.

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- Antenna Impedance: 50 to 75 ohms
- RF Input Power: SSB, 200 Watts PEP; CW, 160 Watts DC
- Carrier Suppression: Better than 40 dB
- Sidband Suppression: Better than 50 dB
- Spurious Radiation: Better than -40 dB
- AF Response: 400 to 2,600 Hz
- Receiving Sensitivity: 0.25 μ V for 10 dB (S+N)/N
- Receiving Selectivity: SSB, 2.4 kHz/-60 dB, 4.4 kHz/-60 dB; CW, 0.5 kHz/-6 dB, 1.5 kHz/-60 dB (*with optional CW filter)
- Image Ratio: Better than 30 dB
- IF Rejection: Better than 50 dB
- Dimension: 333W x 153H x 335 D mm
- Weight: 16.0 kg.

VFO-520S SPECIFICATIONS

- Frequency Range: 5.5-4.9 MHz
- Dimensions: 166W x 150H x 190D mm
- Weight: 3 kg.

SP-520 SPECIFICATIONS

- Speaker Diameter: 120 mm
- Frequency Response: 100-5,000 Hz
- Dimensions: 166W x 150H x 190D mm
- Weight: 1.4 kg.

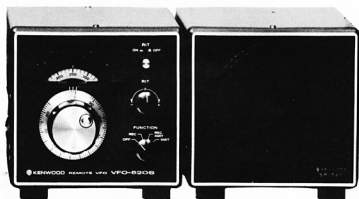
OPTIONAL ACCESSORIES

- YG-3395C ... 500 Hz CW Filter
- DG-5 ... Digital Display.

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MC-50 BASE MICROPHONE
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SM-220 MONITOR
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- 80 WATTS MINIMUM OUTPUT
- FULLY PROTECTED AGAINST POOR LOAD VSWR, OVERHEATING AND EXCESSIVE OR REVERSE SUPPLY RAILS
- EQUIPPED WITH RF VOX AND MANUAL OVERRIDE
- SUPPLIED WITH POWER LEAD AND ALL CONNECTORS

SPECIFICATIONS

Power Output: 80 watts minimum RMS output, 100 watts RMS typical.

Power Input: 10 watts nominal for 80 watts output.

Frequency Bandwidth: 144-148 MHz @ -0.5 dB.

Power Requirements: 12.5V nominal @ 12 amps maximum for 80 watts output. 13.8V maximum.

RF Input Connector: 50 ohm BNC.

RF Output Connector: SO 239.

Weight: 4 kg (8 lb. 13 oz.).

Overall Size: 315 x 142 x 105 mm (12 3/8 x 5 5/8 x 4 1/8 in.).

Price Amateur Nett \$265

NEW

HEAR THE 10 METRE ACTIVITY ON YOUR 2 METRE RECEIVER!! 10 METRE CONVERTER — TYPE: MMC 28/144

SPECIFICATIONS

Input Frequency Range: 28-30 MHz.
IF Output Frequency: 144-146 MHz.
Frequency Bandwidth: 2 MHz @ ± 0.5 dB.
Overall Gain: 15 dB min.
Overall Noise Fig.: 1.8 dB.
Size: 110 x 60 x 31 mm.
Weight: 250 g.
Oscillator Frequency: 116 MHz.
Max. Frequency Error at 28 MHz: ± 1 kHz.
RF Connectors: 50 ohm BNC.
DC Power Requirements: 11-13.8V @ 50 mA.

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AMATEUR SATELLITES

Bob Arnold VK3ZBB

There has been a considerable fall-off in activity through satellites during the past few months possibly caused by some of the difficulties in communication such as high noise levels, fading and, for Oscar 8, the Doppler effect. This trend has become apparent since daylight saving commenced in the Eastern States; perhaps the generally late hour of satellite acquisition has something to do with the lack of activity.

OSCAR 7

OSCAR is now in a serious condition. It is still responding to telecommand but when left alone it tends to switch to Mode D, which is the recharge Mode, without either transponder or beacon in operation. The inference of this is that nothing will be heard of AO7 unless a command station switches it on. It would appear that two of the ten Ni-Cad cells have shorted out and if one of these goes open circuit that will be the end of AO7.

Due to the low voltage, which is now between nine and ten volts, the Mode B telemetry is sending meaningless figures but the Mode A telemetry is still operating.

AO7 is now over four years old, and has given us good service, particularly on Mode B. With a little care it may be possible for the satellite to last the four years eight months life of AO6.

OSCAR 8

AO8 is in good condition and operating satisfactorily on both Modes A and J. Wednesday is the special experiment day and on these occasions it is possible to find AO8 in both Modes for some orbits. This can be observed from the telemetry — in Mode A, channel 6 normally indicates a Code 601 but when Mode J is also working a figure of 620 will be observed. In order to conserve AO8, operate on the minimum power to acquire the satellite and never make the down-link signal significantly stronger than the beacon.

RUSSIAN SATELLITES

I am sorry that the information given in the January edition of AR, particularly so far as the predictions were concerned, was way out, but as I indicated then, those notes were written only a few days after the satellite was launched when little was known of its parameters. Even today, a number of questions remain unanswered, but it would seem that we do have the orbit times under control and the predictions given in this issue should be a little more accurate.

The daily progression of the reference orbit is 4 minutes 42.6 seconds and 2.724 degrees to the West. These figures are a little greater than those previously published and give a rather unusual set of

ORBIT PREDICTIONS — MARCH 1979

March	Orbit	AOT Time Z	Long.
1	19623	0105	78
2	19635	0005	63
3	19648	0059	76
4	19661	0153	90
5	19673	0043	75
6	19686	0547	78
7	19698	0546	73
8	19711	0141	87
9	19723	0040	72
10	19736	0134	85
11	19748	0034	70
12	19761	0138	84
13	19773	0027	68
14	19786	0121	82
15	19798	0021	67
16	19811	0115	80
17	19823	0014	65
18	19836	0109	79
19	19848	0008	64
20	19861	0102	77
21	19873	0002	62
22	19886	0056	76
23	19899	0150	89
24	19911	0050	74
25	19924	0144	88
26	19936	0143	73
27	19949	0137	86
28	19961	0037	71
29	19974	0131	85
30	19986	0030	70
31	19999	0125	83

AOT Time Z	Long.	Orbit	AOT Time Z	Long.
5026	0032	51	5026	0032
5040	0037	52	5040	0037
5054	0042	53	5054	0042
5068	0047	54	5068	0047
5082	0053	56	5082	0053
5096	0058	57	5096	0058
5110	0103	59	5110	0103
5124	0108	60	5124	0108
5138	0113	61	5138	0113
5152	0119	62	5152	0119
5166	0124	64	5166	0124
5180	0129	65	5180	0129
5194	0134	66	5194	0134
5208	0139	68	5208	0139
5221	0001	43	5221	0001
5235	0007	45	5235	0007
5249	0012	46	5249	0012
5263	0017	47	5263	0017
5277	0022	49	5277	0022
5291	0027	50	5291	0027
5305	0033	51	5305	0033
5319	0038	52	5319	0038
5333	0043	54	5333	0043
5347	0048	55	5347	0048
5361	0053	56	5361	0053
5375	0058	58	5375	0058
5389	0104	59	5389	0104
5403	0109	60	5403	0109
5417	0114	62	5417	0114
5431	0119	63	5431	0119
5445	0124	64	5445	0124

RS1 Time Z	Long.	Orbit	RS1 Time Z	Long.
0026	0026	70	0026	0026
0031	0031	72	0031	0031
0035	0035	75	0035	0035
0040	0040	78	0040	0040
0045	0045	81	0045	0045
0050	0050	83	0050	0050
0054	0054	86	0054	0054
0059	0059	89	0059	0059
0104	0104	92	0104	0104
0108	0108	94	0108	0108
0113	0113	97	0113	0113
0118	0118	100	0118	0118
0123	0123	103	0123	0123
0127	0127	105	0127	0127
0132	0132	108	0132	0132
0137	0137	111	0137	0137
0141	0141	114	0141	0141
0146	0146	116	0146	0146
0151	0151	119	0151	0151
0156	0156	122	0156	0156
0000	0000	94	0000	0000
0005	0005	97	0005	0005
0009	0009	100	0009	0009
0014	0014	102	0014	0014
0019	0019	105	0019	0019
0023	0023	108	0023	0023
0028	0028	111	0028	0028
0033	0033	113	0033	0033
0038	0038	116	0038	0038
0042	0042	119	0042	0042
0047	0047	122	0047	0047

acquisition times, quite different from those applicable to the AMSAT satellites.

It is now confirmed that there are two satellites, the second one running fifteen minutes later than the first and 4 degrees further West. I will "stick my neck out" and give a few estimated acquisition times for RS.1 during February —

On Sunday, 4th February, Orbit 1206 should be heard 0128Z on Ascending Node 31. This will be a north-south orbit crossing the equator immediately above Australia at 225 degrees West.

On Saturday, 10th February (Sunday morning local time), the first orbit to be heard will be 1288 at 2201Z with an AN 350. Again, a north-south pass. At 1040Z Sunday we should hear a south-north pass.

On Saturday, 17th February (Sunday morning local time), the first pass to be heard will be 1372 at 2234Z on AN 10 N-S, and again we shall hear it on Sunday at 1110Z on AN 190 S-N.

From the information given above, you should be able to calculate the time and position of orbits subsequent to those given and also for other days of the week. The orbit is two hours approximately and the Westerly progression 30 degrees.

It is now confirmed that if the input power to the satellite is excessive it will automatically switch off, and it appears this is a quite common occurrence as only on rare occasions has the transponder been working. We have heard the beacon on many days but have only enjoyed working through the satellite three or four times when communication has been first class. Therefore, keep your power down to under 10 watts ERP and don't let Australia be the cause of switch off.

There is no sure way in knowing the status of the Russian satellites; all one can

do is to listen to as many orbits as possible and hope the transponder is switched on. If you hear a U or a K being sent after each bit of telemetry you can be assured that it is not on, but if a W or O is heard it probably is switched on. I hope I may have some more information on the interpretation of telemetry data for our next edition.

PROJECT ASERT — PROGRESS REPORT

Bob Arnold VK3ZBB
Ken McCracken VK2CAX

In the September 1978 edition of "Amateur Radio" a report appeared indicating the Federal Executive's support for a scientific investigation of the propagation of VHF radio waves. This study has been named Project ASERT (Amateur Service Experiment in Radio Transmission) and a working group has been formed to initiate and co-ordinate the study. This Committee consists of Bob Arnold VK3ZBB as Co-ordinator, Ken McCracken VK2CAX Scientific Leader, Peter Wolfenden VK3ZPA representing Federal Executive, with Les Janes VK3BKF and Greg Brown VK3YGB as hardware leaders.

The Committee decided to conduct this study in two phases, phase 1 being limited to monitoring a small number of transmission paths during the summer of 1978-79, and phase 2, a more detailed study of more paths, and involving additional receiving stations for a period of at least

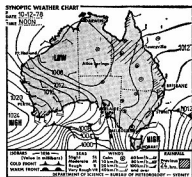


FIGURE 2

twelve months from June 1979. Phase 2 is expected to cover the period of high sunspot activity now projected for early 1980. Phase 1 is now well under way and signals on the following routes are being recorded on a 24 hour basis: (a) Brian Yeoman VK7ZBY in Launceston is monitoring the VK3 and VK5 144 MHz beacons located in Melbourne and Adelaide respectively. (b) David Minchin VK5KK, at Wasleys, near Adelaide, is monitoring the ZL beacon on 52.5 MHz at Palmerston North and is ably assisted by Col Hurst VK5HI and Eric Jamieson VK5LP. (c) Ken McCracken (Sydney) is monitoring the VK5 beacon (52 MHz), and (d) a receiving system constructed by the ASERT Group and located at the QTH of Bruce Roberts VK3ZMR commenced monitoring the VK5 beacon (144 MHz) on New Year's Day. The VK3 station has been designed to obtain experience with receiving equipment and specialised recording devices in preparation for phase 2. It is anticipated that this installation will be moved to a new and permanent QTH in Melbourne at the end of February.

The Committee is grateful for the interest shown by the amateurs mentioned above and for the co-operation that has been forthcoming from the Brisbane VHF Group and Selwyn Cathcart ZL2BJO of Massey University, New Zealand. It is anticipated that the assistance of these stations will be co-opted for Phase 2.

The Committee is currently deliberating on the standards which should be adopted for antennas, receivers and recording

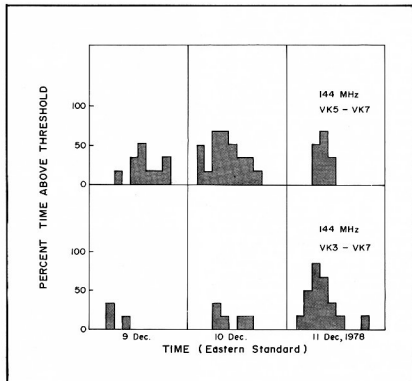


FIGURE 1

equipment and these will be determined in the near future to enable consistent standards to be maintained at all receiving stations.

THE FIRST RESULTS

Brian Yeoman VK7ZBY was the first ASERT station to become operational. His equipment is housed in the control tower at Launceston airport and uses a printing calculator as a data recorder.

Figure 1 displays data obtained from the Launceston receiver during the period 9-11 December 1978. It shows the fraction of each hour for which the beacon signal exceeded the recording threshold, which was set at 0.25 microvolt. The synoptic weather chart for 10 December is given in Figure 2.

It can be seen that there were substantial 144 MHz openings over both paths

throughout the period, presumably associated with the pressure high over Tasmania at the time (Figure 2). The VK5 to VK7 opening was longest on 10 December, while the VK3 to VK7 opening was longest on the following day, consistent with the eastward motion of the pressure high. Throughout the period, it can be seen that the openings tended to occur in the mornings.

THE FUTURE

It is very desirable that the investigation be extended to other Australasian paths, and to the TEP route to Asia, particularly on 144 MHz. Amateurs or groups of amateurs who wish to contribute to this investigation through the establishment and operation of receiving stations should contact the ASERT Co-ordinator, care of this magazine. ■

ARMY WIRELESS SETS OF WORLD WAR II

Compiled by Rodney Champness VK3UG Photos by Ken Reynolds VK3YCY

9. The No. 19 Mk. II is really two transceivers in the one case. It has a small super regenerative receiver and transmitter working on nominally 240 MHz which was used for intercommunications between nearby units, and the main transceiver which covers 2 to 8 MHz. In addition it has an intercom amplifier for communications within the vehicle it is mounted. Until

a few years ago these sets were still being used in army tanks. Probably they needed to be carried in a tank as they weigh 42 kilograms with power supply and base attached. The power supply is a 12 volt DC generator and the set's current drain on CW transmit is 12 amps and on receive 7.5 amps—a big user of power. The final PA valve is an 807 and could be expected

to put out about 15 watts on CW.

The set is quite complicated and not easy to work, but must be rugged to withstand the pounding it would have got in a tank. They were moderately popular with amateurs in the USA but I don't know personally of any amateurs who used them—although some pirate types did a few years back. The No. 19 when coupled with

the RF amplifier No. 2 could run up to 60 watts output on CW and 30 watts AM. Quite a potent signal, and a very heavy drain on a 12 volt battery.

10. The AR8 receiver is the companion to the AT5 transmitter. It is a 6 band VLF, MF and HF receiver, covering from 140 kHz to 20 MHz with a small gap in the tuning range between 740 and 765 kHz. The IF frequency is 755 kHz. The receiver has two RF assemblies, one tuning from 140 kHz to 2 MHz and the other from 2 MHz to 20 MHz, and as a result of this, the receiver can be preset to two frequencies which are selectable by flicking one switch. In addition to its ordinary function as a communications receiver, it has direction finding facilities in the 140 kHz to 2 MHz range. This set was extremely popular and was used in aircraft, on land and in ships, altogether a versatile set. The set obtained power from 12 to 24 volt generators or from the Type S 240 volt AC power supply, which also powered the AT5 transmitter. The AR8 is not an easy set to service, and to work on many parts the various RF assemblies must be completely stripped out of the set—certainly not a job to be undertaken on the battlefield.

The AR8 also proved to be a very popular set with amateurs and many of these sets are still used by short wave listeners. Many modifications appeared in the various magazines to provide bandspread and so forth on amateur bands. One of the most popular mods was to change the audio so that a speaker could be driven instead of headphones. The going price for these units in good order operating off AC power is still in the vicinity of \$50, so they must still be good 30 to 35 years after they were made. ■

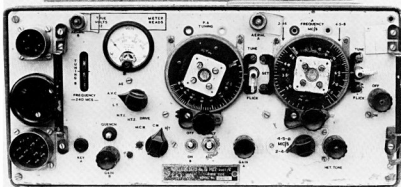


PHOTO No. 9

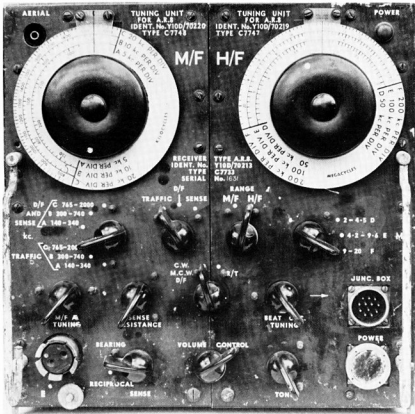


PHOTO No. 10

QSP

RFI AND POLICE SPEED TRAPS

In Radio ZS of June 78 there is a very interesting item concerning the vulnerability of police speed measuring devices to RFI interference.

The equipment in question is of both the radar type and the amphetamine type.

After tests a speeding ticket was withdrawn as it was found in the tests that the various types of speed measuring equipment were affected by RFI from a mobile transmitter in the car whose speed was being measured. The tests showed a wide variation in readings and resulted in the ticket being withdrawn.

The equipment used in ZS may be different to that used locally but if a similar susceptibility to RFI exists then there could be some interesting local cases.

RADAR THREAT TO 70 CM BAND

According to Ham Radio for August 1978 a potential radar interference threat to the 420-450 MHz band is being studied by both AMSAT and the ARRL.

The radar threat is from the US Air Force "PAVE PAWS" long range radar to be installed firstly at Cape Cod Massachusetts and later in California.

This very long range radar has an Average ERP of 1 Billion watts approximately. This would result in a moon reflection of a 10-20 microvolt signal and have significant effects on both humans and equipment within quite a large radius of the antenna. ■

Have you checked
your Call-Sign on
the Address Label?

Are you checking
our bands for
INTRUDERS
AND REPORTING SAME TO
THE INTRUDER WATCH
CO-ORDINATOR?

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

The Editor,
Dear Sir,

The push-button tuneable AM car radio evolved over many years as a device which combines convenience (push-button selection, instantly reprogrammable), flexibility (continuous tuning), and above all, safety for the car driver. The present generation of mobile transceivers for 2-metre FM fails to meet all these requirements, being either inconvenient and therefore dangerous because of the time taken to select a new channel (synthesiser rigs), or inflexible because of a limited number of fixed channels which can (sometimes) be reprogrammed at home.

I offer the following specifications for the 2m mobile rig I would like to buy — manufacturers please take note:

- (a) 12 channels selectable by rotary switch (as on the IC223).
 - (b) One of the above switch positions to revert to synthesiser operation in 25 kHz steps with the usual setting knobs.
 - (c) Digital display showing the frequency in use (on all 12 switch positions).
 - (d) Fixed channels to be reprogrammable with non-volatile CMOS memory (as in recent electronic calculators) simply by setting the channel selector switch and the synthesiser frequency, and then pressing a "store" button. Simplex or repeater up/down operation to be included in this programming so that these switches need only be used manually in the 12th synthesiser position of the channel selector switch, and of course for reprogramming.
 - (e) Magnitude of repeater shift (normally 600 kHz) to be reprogrammable in a similar way.
 - (f) Continuous scanning of all 12 channels to be available.
 - (g) Transmitter output power to be 25W/5W, thus combining reasonable battery economy with an ability to get out of some of our VHF "holes" in hilly terrain.
- There is no reason with present technology why such a rig should not be available today.

Yours faithfully,
Guy Fletcher VK2BFF.

The Editor,
Dear Sir,

This letter is to inform you and your Licensed Amateur Radio Operators that the 2 metre repeater operated by the Darling Downs Radio Club at Toowoomba VK4RDD, will change frequency on 2nd December, 1978, from Channel 44 repeater to Repeater Channel 74 (input: 147.7 MHz, output 147.1 MHz). The change has been approved by the Post and Telecommunications Department.

The reason for the change is to eliminate interference problems caused by the allocation of the same repeater channel (44) in adjacent areas, viz. Bundaberg, Toowoomba and Lismore where operators in some locations can access two and sometimes three repeaters at the same time.

The Club meets at the Toowoomba Education Centre, Baker Street, Toowoomba, at 7.30 p.m. on the last Friday of every month except December. Visitors are welcome.

A club net on the repeater, channel 74 is held every Thursday night at 8.00 p.m. local time.

The Secretary's address is 38 Wentworth Street, Toowoomba.

Yours faithfully,
G. J. Pennycuik VK4AGP,
Secretary/Treasurer.

The Editor,
Dear Sir,

The Auction Sale conducted for the Institute by the NSW Division on Saturday, 28th October, was very successful both in terms of the volume of goods for sale and the money raised.

Despite the poor weather conditions an estimated 600 plus attended.

All the items for the Auction had been donated by the Dick Smith Group. Items included a wide range of shop soiled lines, samples, etc., all of which were sold on the day.

\$3,500 was raised and goes to the Institute to be used nationally in assisting the education of future members of the Amateur Radio Service.

Our thanks to your publication for the excellent publicity given in recent issues, which no doubt contributed to the attendance and success.

My own thanks also to the many helpers who assisted on the day and to Terry VK2TQ, who did an excellent job as the Auctioneer.

73 Tim Mills VK2ZTM,
VK2 Division Secretary.

The Editor,
Dear Sir,

In reply to the question asked by Mr. Champness VK3UG, in "Novice Notes", AR September 1978, "Are They the First?", not quite. Graeme and I received our Novice Amateur Station licences, numbers SC16 and SC11 (VK8NR and VK8NS) on 7 September 1976, having been successful in the first Novice Amateur exam. held in March 1976.

The station receiver was a Lafayette KT-340 and 80 Mx transmitter "OM" brew, 10 watts, built entirely (power supply too) from an old TV. The antenna was a shortened vertical; 16 feet of dowelling helically wound with about 130 feet of wire, mounted on the galvanised iron roof (the ground plane).

On 6 October 1976 Graeme obtained his full ticket, becoming VK8GG, and I graduated to VK85A a couple of months later. Possibly VK8NR is the shortest lived novice (one month!) A few people have asked what happened to him.

The station rapidly expanded: an FT101E made operating a lot easier (for both ends of QSOs) though we still both enjoy using the home brew. We have just returned from a holiday in the U.K. where we operated during our travels. The most pleasing contact for myself was with DL3CU in Essen on 80m using a home made solid state 10W TX. DL3CU was using his 2nd antenna and I was using a UHF TV antenna (aided by a splendid little transmatch, ARRL Handbook 1977: A Transmatch for GRP Rigs).



Sue VK85U — the shack now.

It is interesting to note that when we Darwin Novices (also Terry, VK8NTA; Doug, VK8NJD/ZJD; Ed, VK8NER/ZER and Jeff, VK8NKN/8) started out with our 10W transmitters, a number of full call operators were inspired to see what they could do with 10 watts.

3.1.79
The Editor,
Dear Sir,

I refer to the "OSP" on page 36 of AR for January. Once again I draw your attention to the fact that the WIA in Australia has its own official DXCC organisation ably administered by Brian Austin VK3CA.

Therefore, it is unnecessary, and far too costly to forward QSL cards to the ARRL in U.S.A. for DXCC credits. Why not support our very own DXCC Department!

A quick check of the last published DXCC list in AR, shows at least a dozen VKs with over 300 countries confirmed, none of whom appear in the "OST" list for reasons outlined above.

Obviously the writer of this "OSP" has not done his homework and it is not the first time this unfair criticism of the Australian DXer has been published in AR!

Would it be possible to have more frequent DXCC listings published please?

Sincerely,
Fred Lubach VK4RF

The Editor,
Dear Sir,

A footnote to you does not excuse the printing of the article about the "Wooley Bum Certificate of Achievement Award" in December AR.

I, for one, have reservations about accepting a "Wooley Bum" number, until truthful answers are given to the following questions—

- Who is "David Ramsbottom"?
- Why does he use an alias?
- Does he often pirate on 27.355?
- Has he ever pirated on 28.570?
- Have any "Wooley Bum" members pirated on 2 metres?

Has "David Ramsbottom" ever been prosecuted by FAT?

The name of the club is of an extremely low standard, as is the layout of the certificate, e.g. the dog urinating on the seal. I'm sure at these two points I do not stand alone.

If answers are given truthfully and all is revealed about the somewhat dubious character and activities of the club, my reservations may be removed. Until then . . .

VK3V — Name and address supplied, but withheld at writer's request.

EDITOR'S NOTE: Perhaps "David Ramsbottom", whoever he may be, would care to write to me with answers to the above — (VK3UV).

The Editor,
Dear Sir,

On the 21st of January, 1979, with my friends I will be flying from Australia to Lord Howe Island, VK2. For a period of approximately nine days our party will be active on 10m, 15m and 80m.

The stations call signs are VK2NUN/Port Russell, VK6NZD/Port Bill, VK3NKO/Port Merv.

Our QSL information is c/o VK2NUN, Box 404, Casino, N.S.W., Australia 2470.

Thanking you,
Russell Ian Ashdown VK2NUN.

Editor's Note: Received 29.12.78 which was too late for January AR.

The Editor,
Dear Sir,

In 'Amateur Radio' Magazine you ask readers to "support our advertisers" but country members have no other option. Our sole contact with equipment suppliers is through your pages, equipment must be purchased, through mail order and are usually paid for in advance with the order.

Now when one examines these advertisements and compares prices one comes up with some interesting figures. For example a TH6DX range in price from \$300 to \$399 a 33% difference. (AR Nov. 78). In the same issue a Yaesu FT-101E \$699 to \$975 (or POA you can guess the greater) also a Kenwood TS520S from \$665 to \$789 (or POA again) and the humble 18 AVT from \$125 to \$155.

These are just a few examples and I also add that one advertiser had the same TS520S for two different prices on the one page.

Well, if the firm with the cheapest price is making a comfortable and reasonable profit then all the others are making a huge rip-off. Just how can they justify these prices? And to boot most of these people are fellow licenced amateurs.

What can be done? (1) More letters to the Editor, just to show that there are other concerned amateurs is one way. (2) I urge fellow amateurs to shop around and always buy the cheapest available. (3) The WIA should represent its members, as a consumer group, and put pressure on retailers of amateur gear to keep their profit margins at a sensible level.

(4) Further to (3) above the WIA being a registered Company with all members share-holders should establish a Subsidiary Company for the purpose of importing and retailing amateur gear to its members only. A full time manager may need to be appointed. I feel this would be a real service to country members and certainly would encourage higher membership of the WIA.

Well, I've had my gripe now, I would like to know the thoughts of other amateurs and some more constructive ideas.

Alan Parr VK4AJA

9.12.78

The Editor,

Dear Sir,
I refer to page 37 of December, 1978, Issue reporting the formation of the "Wooley Bum" Club and the introduction of its so-called "achievement award".

Those of us who hold the Amateur Service in esteem, based on its long and worthwhile record of public benefit and its fostering of "the amateur spirit", must feel dismayed at the invasion of our service by "27 MHz 'bootleg' operators", who blatantly flaunt their illegitimate ancestry in our Institute journal and break down the standards which we have come to regard as inherent in the Amateur Radio situation.

We have already suffered and lost the invasion of our 27 MHz amateur band to the illegal, ruthless and thoroughly forces of pirate radio, big business and political expediency. Now we can see the thin edge of the wedge in phase two — the invasion of the Amateur Service by a group determined to inject the sub-standard mental processes of the dregs of the CB movement.

To find that your — OUR — Amateur Radio publication gives support and publicity to this latest conspiracy is disturbing — disgusting — in the extreme.

I have proposed the upgrading of CB users to Amateur status and, in fact, have performed in the Instructional area to introduce ex-CB Noise operators since the inception of the Noise scheme. However, under no circumstances do I condone the new development, whereby such groups as that encouraged by your editorial policy will infiltrate the Amateur Radio movement and bring to it their "ocker" attitudes and sinister policies.

I expect that the WIA at Federal level will get up from the floor and resist vigorously similar attempts by this second wave of invaders. STRONG and vigorous leadership is needed in this new situation. I shall be pleasantly surprised if it emerges on the basis of past performance during the CB pirate invasions. Meanwhile, I shall put my Membership Renewal Notice aside and wait until adequate action occurs to warrant my continued support of an Institute for which I have had a long-established affection and which I have supported for many years.

Rev C. Black VK2YA.

4.12.78

The Editor,

Dear Sir,
Recently having sat for the November AOCOP Telegraphy Examination, I am concerned about the apparent confusion regarding the Morse code being sent. I understand that, a few years ago, the WIA requested hand sent Morse code to be abolished and ITU machine Morse be used, and for good reason.

Apparently, due to a more recent request from the WIA not to use ITU machine Morse for the 5 WPM novice examinations, the Post and Telegraphs Department has decided to use hand sent Morse (by hand sent I mean just that, not even a bug or any other aid) for all Telegraphy Examinations they conduct, both commercial and amateur. I am sure that this was not the original intention.

What I believe we require is ITU machine Morse for AOCOP and commercial exams and for novice exams ITU machine characters at 8 - 10 WPM with the spacing between characters and words increased to bring the test back to the 5 WPM requirement. At the present, all we have is confusion.

Can we please get back to a nation-wide standard, knowing that if we practice and learn a particular style of Morse code, that is what the Posts and Telegraphs Department will be using at the examinations.

Peter S. Collins VK3ZVO.

EDITOR'S NOTE—The P. & T. told WIA that ITU standard was to be used and would be machine sent however, some technical problems arose preventing this and hand sent Morse still remains. We agree that novice Morse should be 10 WPM characters with longer spaces between words. This was brought before P. & T. some time ago and has not yet been resolved. Many complaints have been received from members, and the matter will continue to be pursued by the WIA.

26.10.78

The Editor,

Dear Sir,
I would like to make some comments and suggestions re the "VK-ZL-Oceanic DX Contest".

Before proceeding further I would advise readers to study the rules of the 1978 contest as found in AR, August 1978, page 48. It will be noted that a considerable number of mistakes appeared in the rules. The closing date for VK-ZL stations was given as 30th YEAR later than it should have been. Rule 10 parts (c) and (d) were listed as part (b) in three places.

1) PERIOD: Currently the contest starts at 1000 hrs. UTC Saturday and finishes at 1000 hrs. Sunday. Why not start the contest at 0000 hrs. UTC Saturday and finish at 0000 hrs. Monday. All other major DX contests start at 0000 hrs. Saturday and run for 48 hrs.

The current time period is very restrictive when examined in detail, very few people get the chance to operate throughout the whole 24 hrs. due to commitments to work and families. Out of 24 hrs. the "average" operator, if there is such a being, would be lucky to get in 8 hrs. time on air.

By increasing the period from 24 to 48 hrs. everyone gets a far more reasonable chance to compete and the far more even spread of conditions than in one critical 24 hr. period. To even things out there could be two different sections, a 24 hr. and a 48 hr.

2) CYPHERS: The rules for the 1978 contest stated that the serial number following the signal report "may begin with any number between 001 and 100 for the first contact . . . WHY? What possible point can there be in starting at any number other than 001 if serial numbers are to be used. I can see little justification for the use of serial numbers in a contest anyway apart from the concept of using the contest as a traffic handling exercise. For far too many operators serial numbers tend to become no more than an ego trip and obviously the very high contest number when received makes the station just starting feel at a great disadvantage.

3) CLARIFICATION OF RULE 9 (e): As this rule currently stands I consider it open to different interpretation by various operators. e.g. WSA/1 is counted as a W1 for scoring purposes. This is clear enough but what do you count the prefix of say JKA/AA/5 as? The answer cannot be J/5 as currently no such prefix exists, only J/5 or J/5. The operator however cannot be expected to know this sort of information particularly with the mass of strange prefixes in areas such as the U.S.A. where even the locals are staggered by it all.

4) LOGS: Anyone who has tried to write up a contest log with 1,000 plus QSOs will know only too well what a chore this is! Most operators use a rough contest log then transfer it to the station

log after the contest is over. The next step is to write up the contest log for sending to the organiser for checking. This means that most entrants end up writing the details up to three times. Not only is this a terrible bore but also a ridiculous waste of time and effort, just to prove in a fashion that your entry is honest. Why should the 99.9% of honest operators have to do this to indicate that they aren't cheats? After all, there are plenty of chances for the dishonest operator to cheat if he wants to.

I can see no valid reason why the GCR (General Certification Rule) as used for Award applications couldn't be used with contests. Any two other Amateurs of higher licence class could then certify a summary sheet showing the essential details of the contest entry after viewing the operator's station log. This would save untold hours of writing and in addition save considerable amounts of postage in forwarding entries overseas where airmail is the only sure (but awfully expensive) way of ensuring the entry arrives in time.

Admittedly, the remote area operator may be at a disadvantage using this system, but no more so than currently with awards. Surely the vast majority of honest operators deserve the chance to benefit from this system.

Making the business of entering a contest easier can only help make the contest an even more successful one than it is now where vast numbers who take part fail to enter a log because of the enormous work involved.

Geoff Wilson VK3AKM.

AROUND THE TRADE

VICOM APPOINTED JOSTYKIT DISTRIBUTOR

Vicom International Pty. Limited has been appointed Pacific area distributor for JOSTYKIT of Denmark.

JOSTYKIT is a leading manufacturer of high quality kits throughout Europe and is renowned for the attention given to aesthetic design and presentation. The kits include comprehensive instruction booklets giving precise directions for assembly and testing together with circuit diagrams, drawings of components and soldering techniques.

Attractive Scandinavian-style extruded aluminium cases and knobs are available for most of the kits. A spokesman for VICOM said that there had been a huge demand for the kits which give a much more professional look when completed and give the customer a higher degree of satisfaction.

Qualified electronic engineers are employed by JOSTYKIT to work on improving existing kits and on new developments.

About 40 different kits are now available and the range will be extended to about 100 kits covering audio, laboratory, amateur radio and other interests.

BRITAIN EQUIPS PAPUA NEW GUINEA RADIO CENTRES

A British electronics company, which has recently provided broadcasting studios in Vienna, France and Kuwait, has obtained a new order for three more broadcast centres from the National Broadcast Corporation of Papua New Guinea. The company had previously had a contract for four other studios in Papua New Guinea.

The company is Neve Electronics of Royston, Hertfordshire (Herts. Eng.). The contract (obtained through Neve Electronics' Australian agents, Magna-Techonics) covers design, procurement, installation and commissioning of complete radio broadcast centres.

Installation of the equipment has been at Port Moresby, Manus, Karama, and Goroka, and the stations are scheduled to be fully operational by the end of this year. The new order is for studios at Wabag, Vanimo and Daru, which should be on the air by May next year.

Each Neve broadcasting centre consists of two studios with technical apparatus room. The equipment for each includes sound-mixing consoles with talk-back and monitoring facilities, while the ap-

paratus room houses programme switching and associated equipment.

(Nave Electronics International, Cambridge House, Royston, Hertfordshire; Australian Agent: Magna-Technics, 14 White St., Artarmon N.S.W.) ■

YOU and DX

Mike Bazley VK6HD

6 James Road, Kalamunda W.A. 6076

Why is it that AR does not publish a DX column? A question I asked myself and got, what I suppose was a reasonable reply — no one has offered to write one. So here goes! I do not suggest that I am the best that is available, but I appear to be the only one obtainable!

How does one tackle the numerous problems facing a DX column writer? The main one, of course, is being up to date. With copy required well in advance, often a DXpedition will have come and gone without any advance publicity being given. If you believe you would like a DX column then your help is required. Any advance information on any DX activity would be most welcome.

Secondly, what is DX? To some it may be the thrill of working a large building in New York (you

haven't worked 4U1UN yet?). To others there is the pleasure of a QSO with anyone outside this island continent and to others there is the kick from working GRP.

Thirdly, how does one tie in the differing propagation conditions between East and West coasts?

This writer does not suggest he has the answers to these problems but in the ensuing months I hope to present something that may be acceptable. Any column is only as good as its readers, comments good or bad, information, photographs are all welcomed and appreciated.

Yes, I do call myself a DXer.

Yes, I do chase DX on all the HF bands.

Well, 1978 has gone and for some it has been a good year. Clipperton finally showed, there was activity from South Sandwich, Iraq and Somalia. Here's hoping that 1979 will bring Bouvet, Burma and China. You never know.

Rumour has it that a group of VKs or ZLs are going to activate Spratly during 1979. How about some more information on this one?

Bouvet should have shown by December 24th. I hope all those who needed it made it.

For the CW buffs, LU3ZY is active from South Sandwich on the odd occasions, usually around 14025 kHz.

At the time of writing (late December) there was still no word from the ARRL whether or when DESCECHOE will count. Could this be one that got away?

Don't forget to keep your ears open for 601FG if you missed out last time. This one should be re-activated in early 1979.

Rumour has it that there could be activity from Peter Island. (71 South, 90 East) sometime in February.

Finally, don't forget those long path openings on 10 and 15 metres especially during February and March. Ten metres has produced some pleasant DX surprises just before the band closes up for the evening.

Happy hunting.

QTHs you may have missed:

D68AD via G3RWA,
GU5CIA via N6MA,
Y11BGD P.O. Box 5864, Baghdad,
661FG via I2MOP.

STOP PRESS

BOUVET ISLAND

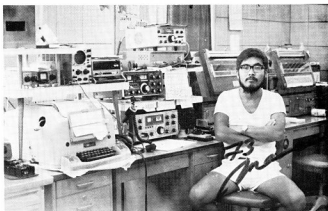
Ship tugged propeller and was towed back to Cape Town. Rumour has it that it should return to Bouvet at end of January and operations will commence by 3Y1VC and 3Y5DQ until mid-February. Frequencies to watch are SSB 14300, 21300, 28600; CW 14030, 21030, 28020.

EDITOR'S NOTE: We welcome Mike's offer as DX contributor and trust that our readers will give him as much assistance as possible by forwarding your DX comments direct to him. ■

QSP

SPECIAL CALL SIGN

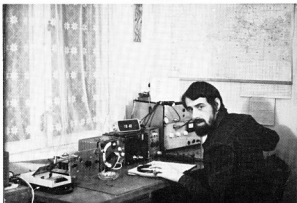
To mark the 150th anniversary of the University of Cape Town, founded in 1829, the SARL will be setting up a special station at the University, with the call sign ZS1UCT, from 17th February to 4th March, 1979. Operations will be all modes on the 10 to 40m bands and an award will be issued — details available from SARL Awards Manager, Box 5100, Cape Town 8000, RSA. ■



Masaaki Saito JA8IEV/JDI operates from Minami-Tori-Shima. QSLs via JA8JL.



ABOVE: DAS OK 1DDL.



LEFT: LUDEK OK1HAS.

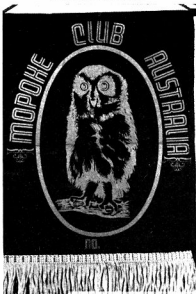
INTERIM MOPOKE CLUB RULES

(Amended 15/11/1978)

- The purpose of the Club Awards is to:
 - Further the use of the bands in the "wee small hours".
 - Ensure continuing conviviality among club members.
 - Provide some impetus and reward for aspiring nightwits.
- The significance of the Club name is that the "Mopoke" is a name applied to various indigenous nocturnal birds, in particular the "Boobook" owl, who features on the bannerette.
- Qualification for initial and continuing active membership is:
 - A total of thirty hours of operation between 0100 and 0600 local time. Contacts which have commenced prior to 0600LT continue to be valid up to 0700LT. Where contact is between stations in differing time zones, the most advantageous local time shall apply.
 - The thirty hours must include at least two separate four hour periods of continuous operation.
 - Contact (within 0100-0600) of one hour continuous with a committee member.
- The first applicant from each country (DXCC list) excepting P29 and ZL may substitute proven contact with at least five individual committee members, with the 0100-0600 time and one hour duration limitations waived, for requirement under 3(c).
- In the case of P29 and ZL, the 0100-0600 limitation still applies.
- Thereafter however, subsequent applicants from each country already having a charter member must follow the normal qualification rules.
- Once the Club has been "chartered" in a different country, it may, if it so desires operate at a semi autonomous unit. (It may not change rules without the approval of committee members).
- It is hoped that good interaction would still occur, and to that end, when the time is correct, auxiliary Mopoke net(s) are envisaged, not necessarily limited to 0100-0600LT.
- Any band, and any mode legally permissible.
- Net operation is permissible, in fact encouraged.
- In general, contacts are not limited to club members.
- Membership is open to any country.
- For continuing active membership (and hence voting rights) the requirement is a total of four hours operation per month within 0100-0600.
- All time requirements are of course subject to health and other acceptable limitations as determined by the committee from time to time.
- While charter members are limited to ten in Australia, the initial member from each different country (DXCC list) will become a charter member of the club as a whole, therefore the number of charter members will expand from time to time as new countries join and establish their own chapters.
- SWL's are also cordially invited to seek membership.
 - In their case please substitute "Logged Contact", for "Contact".
 - In this case please log "Time In" and "Time Out" of station(s) intercepted.
 - SWL Mopokes will have their club number prefixed by "L" to differentiate between types of members, and also to individually reward their efforts.
- It is envisaged that in the very near future special Mopoke QSL cards will be printed and made available.

- When applying for membership, neither QSL cards nor detailed logs are required, simply a list of contacts claimed showing date, duration in local time, band and mode employed.
- Three contacts at random from the list supplied by the applicant will be checked in writing by a committee member.
- The committee initially to consist of the ten charter members in Australia, plus overseas charter members as they join.
 - Thereafter, the committee to be elected annually by a simple majority of club members eligible to vote.
- All decisions affecting the Club to be made by a majority of committee members active at that time.
- Twenty percent of Club members in writing shall be a sufficient number for a matter to be put to a general vote, the outcome of which shall be binding upon the Club, the number of votes required being a simple majority of all members eligible to vote.
- Club nets, competitions, awards and constitutional amendments to be decided upon by a simple majority vote of those eligible.
- The interim net active now is 3565 KHz at and from 1400GMT (Fridays date) Saturday morning local time.
- Contacts (for qualification) count as from 0100 local time July 1978.
- Allocation of membership number and initial award(s) may be effected by any one committee member after consultation with as many of the committee members as may be readily contactable. (Mail/Phone/Club Net).
- The decisions of the committee shall be final and binding upon all club members unless challenged and overturned by a general vote.
- A committee decision must be challenged within one month in writing if such a challenge is intended.
- The basic award shall consist of a bannerette and certificate, with an optional extra of a Mopoke statuette or key chain also envisaged for the future.
- Subsequent awards and/or endorsements to be endorsed by general vote of those eligible club members.
- An inactive member may restore voting rights by compliance for one month with the requirements for active membership.
- The Club can be run as a non profit organisation, except that funds may be accrued for routine overheads and for such purposes as decided by a general vote from time to time.

Mopoke Club Bannerette.



ANTENNA PARTS, KITS

V
K
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V
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QUAD HUB, \$44.20 plus Postage
(3 kg) mass.

QUAD KIT, \$190.50, freight forward
Consisting of Hub: 12 ft. solid F/G
Spreaders: Aluminium Extenders.
Ferrules, Adaptors: 350 ft. 0.064 Hard
Drawn Copper wire.
Nylon line and insulators.

MOBILE ANTENNA PARTS, etc.

NEW BUSINESS ADDRESS:

J. VAILE

3 LESLIE COURT, BURWOOD
VIC. 3125. — PHONE 288 1047

30. Any funds at all times to remain the property of the Club and to remain under the control of the committee.

31. A formal constitution to be adopted if possible at the First Annual General Meeting.

NOTE: Cost (including packaging and posting) of membership, certificate and bannerette \$5 Australian. (May alter as time goes by to keep up with costs).
Information from R. J. Whitehead VK3NHA. ■

QSP

EARLY DAYS

Recently an O.T. sorted out his old QSL cards and decided to pass on the information of his CW (VK only) contacts for 2 full years, 1930/31. This was a time when amateurs were on 25 watt max. power. A listing of several points showed by these cards only 1 in 7 "hams" was C. Cont., about 85 per cent self excited rigs. 20 per cent of the QSO's were over the 25W limit. The top 5 of these averaged 80W. 66 per cent; 2 out of 3 hams, used or had an end-fed Zepp (tuned feeders). The rest were: Centre feed Zepp, Single wire feed Marconi and 600 ohm open wire feed. Receivers 2 valve 40 per cent, 3 valve (0-V-2) 30 per cent, Supers and 3 and 4 valve sets with a SG RF stage 30 per cent.

Tx: 30 per cent were 10W or lower, 50 per cent between 10W and 25W. Over 15W the 210 and 7804/10, also TC04/10. Till December 1931, 2 amateurs claimed 61 countries worked.

— "V.P.T.G."

EDITOR'S NOTE: Contributions from Old Timers on their activities in the years approx. 1925-1935 would be most welcome, as there is much information hidden away in log books etc. which will otherwise not be brought to light. (VK3UV) ■

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 2523

AMATEUR BAND BEACONS

Freq.	Call Sign Location
50.025	6Y5RC - Jamaica
50.050	WATENCX - Maine
50.060	TIZNA - Costa Rica
50.087	WAGMHZ - San Diego
50.087	WASBJRA - Los Angeles
50.088	VE1SIX - New Brunswick
50.092	W7KMA - Oregon
50.098	KG6JHJ - Guam
50.100	ZK1AA - Cook Island*
50.101	FOODR - Tahiti*
50.104	KH8EQI - Pearl Harbour
50.110	HL9WI - Seoul*
50.110	KGJ5AO - Guam
50.110	JK1YAA - Marcus Island
50.110	KG5HK - Marshall Island*
50.110	5B4CY - Cyprus
51.000	YJBPV - New Caledonia
52.110	HL9WI - Seoul*
52.200	KG3VF - Darwin
52.300	VK6RTT - Perth - 145.000
52.350	VK6RTT - Cairns
52.400	VK7RMT - Launceston
52.440	VK4RTL - Townsville
52.450	VK2WI - Sydney
52.500	3D2AA - Fiji
52.500	ZL2VHP - Palmerston North
52.550	JAG2VY - Nagoya
52.600	VK6RTT - Albany
53.000	VK5VF - Mt. Lofty
53.100	VK6MA - Mawson
54.100	VK2WI - Sydney
54.400	VK4RTT - Mt. Mowbulla
54.475	VK1RTA - Canberra
54.500	VK6RTT - Albany
54.700	VK3RTG - Vermont
54.800	VK5VF - Mt. Lofty
54.900	VK7RTX - Ulverstone
54.900	VK6RTT - Perth
54.950	ZL1VHF - Auckland
54.950	ZL1VHF - Waikeke
54.950	ZL1VHF - Wellington
54.950	ZL2VHP - Palmerston North
54.950	ZL1VHF - Christchurch
54.950	ZL1VHF - Dunedin
54.950	VK4BVB - Brisbane
54.950	VK3RPX - Ballarat
54.950	VK7RTT - Ulverstone

Additionally, the following may be operating:

50.013	WBSKAP - California
50.100	SWIAS - Samoa

*Not really sure whether these beacons are actually on the air, but they have been known to operate and with the DX prospects being so good they may now be operating. HL9WI did operate on this frequency as well at one time.

There have been some favourable comments on the present method of listing the beacons, so it will be continued for the time being. I make no apologies for including overseas beacons, many have already been heard in VK and the remainder could be also before long. While on this point "Break-in" for October 1978 carried a table of monthly smoothed sunspot numbers using the modified Ohl (Russian) method for Cycle 21. A few excerpts are Feb. 1978 64, July 78 89.5, Oct. 78 102.7, Jan. 1979 110.8, July 79 131.1, Dec. 79 148.1, Feb. 1980 153.4, May 80 153.6 (peak), Dec. 80 141.2, June 1981 126.2, Dec. 81 120.6, etc. The Feb. 1978 prediction was 64.4 but the level actually reached was 90, with nearly two years to go! So it looks as though there could be almost unlimited DX possibilities, with any VHF services suffering interference, whilst point to point HF communications will face considerable disruption.

WHAT'S HAPPENED SINCE 26-9-78? WHERE? SIX METRES, OF COURSE

As David VK5KK has more opportunities of operating on the air than I do, I have asked him to give

an outline of what has transpired on the VHF bands, six metres in particular, during the period 26-9-78 to about the end of 1978. I present the information in David's own style.

"One of those solar flare things again on 26-9-78. KH8EQI 5 x 9+ at 0845Z to 0930Z. Auroral propagation 0700 to 1430Z. Noted Darrell VK3AJR on 144 MHz at 0840Z. VK3AZYP with IC502 plus 20 watts to 5 x 9, 6 x 10 from 0330 to 0600Z. P.S. On 52.05, same time VK7ZAH 5 x 5 and heard VK7DA (both on 144 MHz). All attempts at higher frequencies unsuccessful. JAs 1 to 6 from 1215Z. Worst signal report 5 x 7, 30-9J. JAs 1 to 6, 1000Z averaging 5 x 8 for 1 hour, plus VK4s to 1330Z.

"1-10: One JA1, 5 x 9! JA heard every day on 50 MHz from 1-10 to 11-10 plus JAs daytime on 52 MHz on 3, 5, 6, 9, 10 from 0330 to 0600Z. Our 16 foot rotating section with 6 on top fell over on 2-10! 12-10: Large JA opening from 1215 to 1330Z (1 to 6 areas). Antennae down to 14-10 when stacked 8/8 erected. 15-10: Large JA opening 1222Z onwards (1 to 3) plus KH8EQI 5 x 5 0900Z. 16-10: Worked WAGMHZ and KH8EQI 0550Z and 1012Z. First heard calling VK2YDY before contact was dropped out 1120Z, signals both ways 5 x 9. Note the beacon is 80 watts to 6 element. Large JA opening 1212 to 1330Z. (Note: KH8EQI stations worked 2 MHz split frequency.)

"From 17-10 to 3-11 at least one JA worked on 52 MHz each day, best days 17, 20, 22, 24, 25, 26, 27, 28 and 3-11. KH8EQI heard 25-10 5 x 5 at 1330Z by VK5AUV. Some JAs appearing at 1000Z which is early for this longitude. (They should be earlier in the Eastern States). Average time 0200 to 0600Z. From 3-11 to 11-11 no 52 MHz activity but nearly every day something turned up on 50 MHz. On 2-11 KH8EQI 5 x 3 at 0730Z.

"Large JA opening 12-11 1130 to 1210Z plus KA2 and KA8. This one was watched by the rising 30 to 50 MHz monitoring method and worked in like clockwork with the daytime opening. 14-11: JAs on 50 MHz, 15-11: Enormous JA opening from 0230 to 0815Z, only a period of 2 hours in the middle was quiet, many signals to 5 x 9. (This is a major reason my present log book has only lasted 5 months!) ZK1AVZ 5 x 8 at 0855Z.

"17-11: JAs 0300 to 0345Z (1, 7, 8 and 9), 18-11, 19-11 and 20-11: JAs on 50 MHz, 20-11: Large JA opening from 0410 to 0540Z with all areas at least 5 x 5 (yes, 0 to 9 inclusive!) 21-11 and 22-11: JAs from 0600 to 0830, by now sporadic E (Es) is becoming more and more of a good area. Areas VK1 to 8, 20-11: JAs 0300 to 0330Z then from 1155 to 1350Z, a great opening, with 1 to 7 areas with signals to 5 x 9+, 23 to 25-11: JAs on 50 MHz, nothing on 52 MHz again. They disappear until early December. Local DX reasonable with ZL several times.

"5-12: JAs 0300Z, ZL3AAD and ZL3AFZ 5 x 7 0825 to 0902Z, 6-12: JAs at 0300Z. At 1630Z VK5JZG heard KH8EQI 5 x 7 for 20 minutes, and ZL2VHP (beacon) at same time. Recorded at VK5KK on chart recorder same time as confirmation, receiver on 50.1025 MHz to give 1.5 MHz tone. 7-12: JAs on 50 MHz 0330Z to 0400Z, but the good area was 5 x 9 with VK5KK in the shack on the back-up equipment (FT620 and 5 el. yagi) with me at TS600 and 16 elements from me at the same time. The ultimate in GRM P292NL at 0712Z 5 x 9. KH8EQI at 1610Z for 28 minutes on chart recorder. Next few days good local conditions.

"15-12: 302CM 52.050 MHz 0153Z at 5 x 3. Dick runs 30 watts to 3 element. He counted that he is 1000 watts at 6 metres has been worked to VK3. This was the call area changed from VR2 to 302. VK2BYX only other station heard working afterwards, though several foolishly calling on top of him after hearing Phil VK2DY working him, but not being able to hear him themselves. As for matter WHO you are you have to hear them to work them! Rumours spread that some other VK2s worked 302CM at the time but nothing other than this. It is definitely known that at least two heard him on CW but did not read the call to realise the matter. WHO you are at the same time KH8EQI heard 5 x 1 with deep OSB, JAs from 0410 to 0740Z to 5 x 7 for about 50 minutes.

"16, 17, 18-12: weak JAs on 50 MHz around 0300Z. 19-12: KH8IAA, Al from Hilo worked at 5 x 5 first on 52.110 and finally confirmed on 52.050 at 0330Z. In between times he worked several VK2s. KH8EQI from 0230 to 0415Z. This time the beacon was around when JA was there though at 0440Z to 0445Z when I travelled to town. They were still

there when I returned at 0840 and worked a few more! 20-12: KH8EQI plus VK4s 2215 to 2235Z. KH8IAA heard on 50 MHz. From 0235 to 0415Z [note close tie-in to previous day] KH8EQI, JAs 0400 to 0430Z. P292WV 5 x 5 at 0845Z, 21-12: ZL3JK, JH, AD and AQ up to 5 x 9 from 0019 to 0100Z. JAs 0400 to 0440Z. (No KH8EQI, ha, ha.)

"23-12: ZL1AVZ, ZL1BPW and ZL1QJ/M and ZL1AVZ/M. The last two worked on 1002Z on 50 MHz with signals to 5 x 5, mobile, 0300 to 0130Z. One mobile drowned out a well known VK3 on back-scatter. JAs at 0400Z also working ZLs, which was good to observe. 27-12: JAs 0300 to 0410Z to 5 x 9. JH7VYN said my signal was hitting the top stop on the metre and was 5 x 9, 0410Z to 0415Z to 5 x 9+. Looking at the needle this end Kou's 10 watts was murdering my 5 meter! Such conditions stayed like this for 6 minutes before returning to 5 x 9. All areas.

"31-12: ZL2ARW/P 5 x 9 at 0900Z. 1-1-79: JAs 0825 to 0540Z but they got to 51-250 MHz and died back. (Drat!) The two WAGMHZ on 50 MHz, Graham was just back from three weeks holiday. 2-1: JAs again on 50 MHz for more than 3 hours on and off, but not reaching 52 MHz. This is something which has happened too often! Total number of JA contacts for 1978 stands at 621 and have not qualified for 2 metres: only TS600 + 400 watts to 2 x 8 elements 16 metres high and (b) FT620 + 100 watts to 5 element 10m high. Antennae are 23m apart and this means it is possible to listen on 50 MHz or to beacons on 52 MHz on either while talking on the other provided both beacons are not pointed at each other. Comparisons can be made to determine to what extent signals are high or low angle. It can be revealing and good to find out whether sporadic E is at all responsible for extensions. It has been almost 100 per cent reliable. Also 100% reliable for monitoring. These are used to watch MUF and paths. These are connected to separate antennae. From this it can be determined by midday whether conditions will prevail to the north in the afternoon. By monitoring 49.75 (Asian TV) on one receiver and 49.75 (Asian TV) on another, the signal strength peaks at the correct times. Night time TEP is very easy to watch and follow up.

"Logging various stations and DF gives an idea of where to look, e.g. during and after the 302 contact on 15-12-78 notable was the telemetry station on 48.25 MHz, suspected to be from FK8 or further out. It was one to watch when there is F layer out that way. You might work F080R or ZK1AA! Also for KH6 there are a few land mobiles in the 40 MHz region. From the city of all the police radios (Los Angeles) watch 39.82 MHz.

"I am sure that if VK5s can now hear KH8EQI then VK4 is not far away from a repeat of March/April 1958. This equinox coming will be the one to watch the north and any signals in the area will appear. One simple note when the signal strengths lag after. (Even on Es it is interesting the number of jungle green bushwalkers with Armalites you can hear!) All this can be upset by solar flares, but here we have a element yagi for solar flares and a 5 element Yagi for ionospheric noise. Depending on the severity auroral propagation can occur although the last three major flares did not give auroras as high as Adelaide.

"Summing up: It is true that for a lot of the DX you have to be on the band at the right time, but I think with a little bit of useful listening you can determine when something could come through. After a while you get used to the fact that you only have a short term application but are still useful, e.g. watch a distant beacon and you will be surprised just how often it will be heard. Take for instance WAGMHZ and TIZNA to VK5. VK5ZBU has heard both once or twice around 1300Z. 1300Z. Signals are weak but there's a lot of noise. As has also heard WAGMHZ in this time slot. All this occurred from early December to just after the good DX on 20-12. I leave a chart recorder on a frequency on six and two metres at night and when I am not around as part of Project ASERT. Though 2 is sedate, 6 is quite interesting. In future ASERT results will be published on the various findings

of the ASERTS groups in each State. Some people will be surprised to say the least! Please note: Having two 6 metre stations is not greedy, but necessary when you have two call signs in the one shack!

TWO METRES AND ABOVE

David VK5KK continues: "29-9-78: 1308Z VK7ZAH 144.1 5 x 5 on aurora. VK7DA heard."

22-11: VK5 opening, 144 MHz and 432 MHz both 5 x 9 and VK5NY and VK5KK hearing VK5WG 5 x 2 on 1296.12 MHz. Call signs on lower freq. VK5WG and VK5KY.

"20-12: Sporadic E opening on 2 metres to VK2. VK2ZTH 5 x 9 + 0550Z and VK2YDV 5 x 3 at 0545Z both on 144.1 MHz. VK2WJ heard for seven minutes, the complete length of the opening. VK2YWG heard via VK2 channel 9 repeat on Sydney. No use wasting time when this opening occurred. Repeaters and FM nets are vulnerable to pranks. As far as my working is concerned 2 metres consists of SSB/CW only so it's the quick, and the others miss out. Constant monitoring of the meter and the antenna is required. On 28-12: 88 to 108 MHz FM, and Channel 2 TV (ABN2) fills in. Repeaters are good beacons and as the first opening to VK1 and VK2 on 31-12-76 it all helped in this case."

"24-12: VK3 on 144 MHz. SSB must be extinct in some parts of VK3 when you can hear repeaters halfway across Victoria and no one on 144 MHz. SSB, CW and FM are heard. On 28-12: 28-12: VK3AXV and less than a handful of others seem to be the only activity over the border on 144."

28-12: VK6 on 144, 432, 1296 and 2304 MHz. No real limit on signals and frequency! Stations on VK6WG, VK6KZ/P, VK6SG/P, VK6ZED/P, VK6BE, VK6KY, VK6YV, NEW WAVE and others. On 30-12: On 1296 MHz THIS DZ (see separate box). 30-12: and 31-12: Continuation of propagation set on 29-12 plus into VK1. 1-1-79: VK3AXV on 144.1 and VK6 Meadon on 144.5 still through."

"5-1: Good signals from VK3AXV and VK3BEH 144.1. VK5RO also had contacts with VK3AUU, VK3AYO, VK3BPH and VK3AND, all on 144 MHz. On 1-1-79: Strong signal from southern SA from VK5NY and VK5NJ. Neville, who has only recently come on the air and was good copy from his IC202. Col VK5RO worked across land into Mil-dura on 144 signals to 5 x 7, working VK3ZST, VK3BER and VK3AUG. Repeated the effort again on the morning of 10-1."

Thank you, David, for that comprehensive report on the activity from VK5, which indicates that they were sandwiched in the middle of the Continent, we are still getting a very fair share of what is happening. As David's information shows however, we would be doing a lot more if we could operate on 50 MHz, more than half the six metre openings have been missed as a result of the band opening only as far as 50 MHz and not extending to 52 MHz. And unless something is done about it we will be missing out on a lot of very fine contacts later on into W, VE and other call areas because of this 2 MHz separation.

The comprehensive nature of David's report will allow those who live in other areas of Australia to compare with their own records and see what opens when and where, and how often.

MORE ON SIX METRES

Pleasing to note Graham VK2ZV is doing something very useful during his holidays and going out to Y8 country and installing a beacon there to be on the same day and time as 51.999 MHz, and which it is hoped will be able to continue to operate on a 24 hour basis. 10 watts output. The beacon at time of writing has been heard in most States so far, after commencing operation on 6-1-79. VK5KK and others worked VK3RM 0127Z x 7 the same day. On 8-1 Y8VY worked 5 x 9, also by VK5RO. Beacon for 3 hours to 0300Z 5 x 1 to 9. On 9-1 received a report GK5DX had worked a VE7 on 50 MHz!

As I seem to have favoured the southern States during the past two months, Note Hal VK4DO had worked 1357 to 13-11-78, not a great number since. Many openings into VK7 too, but VK3 seems to be the main contact area. On 1-1-79: John VK4ZBJ confirms the Ch. 9 translator is just south of Innisfail, about 200 miles north of Townsville and runs 500 Watts. Great place to put a Ch. 9

TV station, right in the heart of sporadic E and TEP territory!

Vladivostok TV on 49.75 a good pointer to likely JA signals on 50 MHz — well worth monitoring when in shack doing nothing. 10-12: Aub VK5KJ said boys in Camarone working through the Ch. 9 repeater at Busseton, 150 miles south of Perth, so a north south path does exist there at times. Did hear the same day about a 10 GHz contact in VK2 over distance of 180 km, but so far no one has written! 16-12: FKAAK worked by VK3OT, VK3AMK and VK3AKK. 15-12: VK5KJ to 302CM 5 x 3, only active 30Z on six at present. Runs 30 watts to 3 element, distance to V5 over 2700 miles. 27-12: FKAB and FKABX to VK2ZBD and others. For QSLs to FK8 write care of Box 779, Noumea. 9-1: VLKSTO to VK5KK and VK5AVO.

The last letter from Graham VK5GB was dated 24-11 shortly before he went on holidays. Note that for the period 17-10 to 20-11 only one contact on 144.110, this to JAG5ZC at 1220Z on 21-10, which rather indicates as expected a drop off in 2 m re activity during the E season. JAs on 6 metres however, were worked on 17-10, 21, 24, 25, 27, 28, 29 and 30-10. And on November 2, 4, 9, 10, 11, 12, 13, 18 and 23-11. Considerable contacts were made 11-11, 13-11, 18-11 and 23-11. Graham comments he and Brian VK5VU have had a pretty solid session with JAs for many months and have been taking it a bit quieter! The current thunderstorm activity in Darwin also has a restricting influence with so much information this time, some pruning has had to be done to all letters received.

Tony VK5BV worked here on 20-12 from his new QTH at Northam from the temporary shack. He worked 28 JAs on 18-11, 20 on 19-11 and 14 on 20-11. Suffers from heavy power line noise from north at times.

Gery VK2ZGF wrote to me the contacts by VK2ZGF and VK2YDV with KHEQI in October were preceded by contacts by Gery and at least two other N.S.W. stations with KHEQI on 22-4-78, which would thus appear to have been the first into VK2 from that area for probably 20 years. Thanks for writing Gery, it sets the record straight.

FROM OVERSEAS

Ray K5ZMS of SMIRK sends a short note to say much British and French TV has been monitored on the East coast of U.S.A., and that ZB2BL had worked PY2XB for another European to South America.

is with ref I record the passing of Sam Harris, WBUSK/WF1J/WBUJ, on 6th November, 1978. Sam Harris was one of the truly greats of Amateur Radio. He built antennas by the hundreds, after joining the ranks of VHF activity in the 1940s. He compiled VHF notes for both QST and CQ for several years. He was a prime mover in the first EME contacts, and his first column in QST for September 1960 featured information regarding the almost unbelievable contact via EME on 1296 MHz, a milestone in time. He was associated with radio astronomy equipment. He thus became a legend in his own time. He is survived by his wife WHIOY, son WHIIV and daughter.

VIA THE REPEATERS

Ian VK5IK has written from Eudunda for the first time outlining the great coverage which is possible at times via various repeaters. I can only normally include much information about repeaters, as I feel as a rule 2 metres in either SSB, CW or FM simplex. However, in this case the very wide coverage is interesting, but further emphasises the point made by David VK5KK that with so much repeater activity, where are the SSZ stations from the same areas. Surely one mode of contact must lead to another — where are all the 3s?

"Good 2 metre opening to the east on the evening of 1st and morning of 2nd January 1979. VK3RWZ audible most of evening. VK3BYL audible on direct path into VK3RWZ and also on Ch. 8. From 1230Z VK3JRA Ch. 4 and VK3RGL Ch. 8 plus a few others. The VK3JRA signal was the most later very strong signals from VK3RGL Ch. 8 and VK3RMA Ch. 8, than from 2200Z VK3RNE Ch. 8 and VK3RGL and VK3RMA were still strong. VK3RWZ and VK3RGL Ch. 7 were extremely strong, and worked VK3IDA and VK7ZAH through VK3RGL. VK3RGL heard on the direct path into VK3RWZ. VK3RSH heard on Ch. 6, but all quiet by mid-day (0130Z) on 2-1. Heard from David VK3YNB had been the VK3RML Ch. 2 Melbourne repeater had been

disabled by vandalism". Thank you for writing, Ian.

TWO METRES ACROSS THE TASMAN SEA

Great excitement prevailed on the east coast of Australia from Sunday 7-1 through to at least Wednesday 10-1 when many stations in VK2 and VK4 were able to work into New Zealand on 2 metres. First news came to me from Rod VK2BQJ in Sydney, one of my old sparring partners, via a telephone call that he had become aware of the opening about 1400Z on Sunday 7-1, when he observed New Zealand repeaters peaking to 5 x 9+ Rod worked 12 stations at that time, with ZL1TAB, ZL1AVZ on SSB. Others were worked either via New Zealand repeaters or direct on FM. One problem is that ZL repeaters work 700 kHz down in frequency with 12.5 kHz deviation. Unless you have two pieces of equipment you have some problems working through their repeaters!

VK2YJCJ was reported as having worked up to 80 ZL via repeaters. Appears there are few stations with high power SSB, which seemed at that time to be essential for good contacts. Still continuing through to Tuesday 9-1 a.m. local time.

A further message received on Wednesday 10-1 indicates conditions still prevailing, with signals stronger than ever, massive signals from the repeaters, and stations being worked across the Tasman using 1/2 wave whips, etc.

Phone call from Martin VK4ZIL on the Gold Coast, 60 miles south of Brisbane, indicated they had been in on the conditions as well. At the time of phoning, he had worked ZL1HIG, who was running 10 watts at 4 x 1. Also worked ZL2TPY. First heard via the Gold Coast repeater on Ch. 2 at 0730Z. Martin also reported hearing a ZL3. Both beacons on 145.100 and 145.150 had been heard. Martin mentioned it appeared signals were somewhat stronger in Brisbane, where some stations had apparently been working on 144.1 SSB.

432 MHz ACROSS THE TASMAN

A further message from Rod VK2BQJ indicated he had been successful in bridging the space between Australia and New Zealand for the first two way contact on 432 MHz with ZL1TAB on Tuesday 9-1-79 at 0815Z with signals 5 x 5 both ways. Contact had been maintained for about 1 1/2 hours. On 10/1 a one way contact had been made when he had heard ZL2TAB but he was unable to copy Rod.

Congratulations to you, Rod, for your effort, you can now move into the records for a 432 MHz contact from VK2 over the greatest distance, for the first VK to another country contact on 432 MHz. You cannot, however, at this stage anyway, claim the Australian and World record for 432 MHz as the contact between VK6KY and VK3ZDV set on 22-7-78 still stands!

COMMENT

If nothing else comes out of these outstanding contacts on 144 and 432 MHz, it must surely confirm what I have been hammering in this column for the last few years, that I could never understand why more attempts were not made to work VK2L-VK on those two bands. If one can believe what has been written in "Break-In" there are plenty of two metre stations in ZL but they seem to have resolutely refused to look toward VK. And probably as many in VK2 as in ZL, and some most likely. I even heard it said once that New Zealand amateurs only constructed their beams to rotate north and south! That may have been an unkind statement, but one could have been excused for thinking so.

The next move, therefore, is for a general up-grading of antennae on both sides of the Tasman, some more linears after the 1620Z, and some more time looking at the weather patterns, hence more contacts. Who will be the first to work all ZL areas on 432 MHz?

ALICE SPRINGS REPEATER

The Central Australian Repeater VK8RCA is now operational on Channel 8, running 19 watts output from a coaxial dipole antenna. It is presently located at the High School, with a good coverage north and south. Ultimately it is hoped to get it up on the ranges around the town for improved coverage. This news comes from Peter VK8CA, and it is good news, too. At last we will have a 2 metre signal emanating from the Northern Territory, so improving the chances of someone working that

State on 144 MHz. Obvious method would be to first hear the repeater, then switch to simplex FM or for best results SSB or CW on 144. Incidentally, Bill VK5GU built the cavities for the repeater, and Peter VK8CA and Geoff VK8GF were involved in the general construction. Antenna is presently 50 feet high.

I'VE BEEN INVESTIGATED

That's right, an officer of P & T requested permission to come to my shack early in December 1978 to search my log book to see if I had been operating on illegal contacts on 50 MHz. Apparently P & T had read in an overseas publication where I had a contact with JE1HYR on 16th April 1978 on 50.553 MHz. Disappointingly for the Department, I did work JE1HYR and several other JAs that day, but on 52.168 MHz. As shown in the log book and without any alterations either. The investigating officer was very pleasant, and I have no axes to grind over the interview, particularly as I was in the clear and told him so before he travelled the 40 km to my shack.

I asked for a copy of the alleged report and was advised it would need to be obtained from Central Office in Melbourne. Typically, so far, it has not arrived. But I have followed up the matter myself and with the aid of a good friend in Melbourne have obtained a copy of what is probably causing the interest at P & T level. It consists of the 1978 issue of the Japanese CQ magazine which has printed a whole table of stations and frequencies for the 50 and 52 MHz bands.

On 16th April 1978 there was a tremendous opening to Japan and stations from VK2, 3, 4, 5, 6 and 8 were contacting Japanese stations and the table gives a selection of those stations. Whilst the rest of Australia were working on 52 MHz to Japan, I and two other VKs were supposed to be working them on 50 MHz. Strange indeed. The listed contact before mine with JE1HYR was by VK8ZB on 52 MHz, then JE1HYR apparently changed to 50 MHz to work me, so the listing says, then presumably went back to 52 MHz. QSL cards received as a result of those contacts on that day including some from SWLs show I was operating on 52 MHz.

For those of you who have worked Japanese stations and received their QSLs will note that many stations send a pre-printed card with 50 MHz already on it, even though contacts are made on 52 MHz. Others will call the band 50 MHz in line with their allocation. Some will say 52 MHz but use a specific 52 MHz frequency. That's exactly what this large listing of stations has done, there are 50 MHz, and 52 MHz band contacts, also specific frequencies listed on 50 MHz for U.S.A., or other similar areas, also specific frequencies on 52 MHz to Australian stations.

The actual investigation doesn't worry me, particularly as my nose was clean! What I am concerned about is that P & T, in these days of alleged staff shortages and financial worries, can find time to have an officer in another State investigate a triviality, something so vaguely based as a chart in an overseas publication, whilst seemingly ignoring the proliferation of band and frequency contacts by non-licensed operators using CB type equipment. I have no bones to pick with responsible CB operators, but those who operate up to 27.7 MHz, in the 28 MHz band and on 146 MHz are getting away with it because "they are unlicensed" difficult to trace, and so many of them! So the normally law abiding amateurs, because they are licensed, addresses known, can be made the subject of witch hunts.

And supposing say half a dozen amateurs did operate 50 MHz for a brief period. Did they create QRM for the thousands of other legal operators previously mentioned? I don't conduct out of band operation, and still say amateurs should stay within their prescribed bands whilst we continue to fight the stubbornness and red tape of P & T. We can only operate today on our exclusive band of 52 MHz on a non-interference basis. There are no sound reasons for P & T not to move with the times and permit amateurs to operate on 50 MHz in a like manner. Even some concessions to either allow a brief contact to be made on 50 MHz with a licensed station or permit an Australian station to go down to 50 MHz and invite an overseas station to come up to 52 MHz would help to overcome witch hunts. I am sure P & T would find amateurs in general would continue to operate

within the regulations if even temporary concessions could be made in regard to 50 MHz operation during the peak of the present sunspot cycle. If temporary permission say for the next three years was made to so operate whilst an in-depth study was made of the whole position would suffice to keep harmony for now.

What about it P & T? Let the amateurs operate on 50 MHz on a non-interference basis in the following way: (1) To call an OVERSEAS station on 50 MHz with a view to making a contact on 52 MHz and (2) allowing a contact to be made on 50 MHz with an OVERSEAS station. Either option to be available to the Australian amateur. And we need the concession now, not in two or three years time when conditions will be on the wane.

In the meantime, I urge Australian amateurs to confine themselves to 52 MHz knowing that many overseas countries know we are there and may look for us. Whether you take the chance to go down and call an overseas station up to 52 MHz is up to you, I can't stop that, but you will now know P & T will be looking for you as you are easier prey than illegal operators on other frequencies, and the number of citations made by P & T on paper will look good for those who assess the results of investigations.

Just to finish on a more pleasant note, you will be interested to know John VK2ZBU heard VK6SQJ on 50.553 MHz at 0400Z on 11-1 at St. whilst at the same time the beacon VJ6PV was 579 for about half an hour. And no VKs were heard operating on 50 MHz either!

"Closing with the thought for the month: "People who jump to conclusions often frighten the best ones away".

73, The Voice in the Hills.

Australia-New Zealand Two Metre Opening - January 1979

The opening commenced in the early afternoon of Sunday 7th of January and continued till Thursday, 11th January. During the course of the opening an almost stationary high pressure with widely spaced isobars lines whose centre was in the centre of the Tasman and stretched over the East Coast of Australia, the North Island of New Zealand and up into the South Pacific as far as the New Hebrides. During this period, both Australia and New Zealand were experiencing above normal temperatures.

One of the first stations to discover the opening was John VK2AYC who, when he attempted to make contact, was treated with disbelief.

During the early stages of the opening, VK stations close to the coast were at an advantage over stations further inland. The opening appeared to be from Ulladulla in the south to Coles Harbour in the north, and over the entire top half of the New Zealand North Island. As the days of the opening progressed, the area of the opening spread to include Brisbane on this side of the Tasman and the whole of the North Island plus Blenheim and Nelson in the South Island.

Among the more successful stations were Jamie VK2YUJ operating portable on the cliff tops near Newcastle (228 contacts) and John VK2BTQ at Ulladulla (205 plus contacts).

Operation was all modes FM simplex, FM repeater into the 2L repeaters and SSB, some 2Ls succeeded in operating into the Australian repeaters mainly 3 and 6. The Mt. Glorious repeater in Brisbane much to the delight of the VKs.

The most successful 2L appeared to be ZL1TAB with his long yagi on a 37 foot boom. Not only was he in the forefront of the 2 metre 2L operators but was also successful in conjunction with Rod VK2BQJ in having a 1½ hour contact with side-band on 432.1 MHz.

Although this is not an Australian record, it does break the current 2L record of 600 km set in 1971. The approximate distance for this contact was 1395 miles (2230.4 km).

Despite the non-compatibility of the repeater systems (600 kHz against 700 kHz and opposite input/output frequencies) and different simplex chan-

nels, it did not take the boys long to improvise. Our simplex channels 40, 50, 51, were soon alive with VK/ZL QSOs.

Signals varied between S5 and S9+. The opening was at times quite selective with stations only a few miles apart being unable to hear stations, at the other end in a particular location but able to copy another station 40 or 50 miles away. A report was received that Graham VK2ZV, operating as YJ8ZV, was heard working ZLs from Port Vila in the New Hebrides, this is yet to be confirmed. Geoff VK8GF at Taree worked a ZL both using hand helds on simplex with RS all the way.

At the same time as the opening across the Tasman, the conditions in both N.S.W. and in N.Z. for long range repeater operation was at a peak.

Although this is not the only known opening, this is probably the longest duration that is known of in recent times.

Phil Card VK2ZBX.

See Over - Chart and Photo.

1296MHz Record Contact

On 29-12-78 a world record contact was made on 1296.3 MHz between Wal VK6KZ/P and Chris VK5MC at 1220Z over a distance of 2109 km or 1310 miles. Signals S59 both ways.

VK6KZ/P was located at Walpole, west of Albany, at a Lat. south of 35 degrees 1.24, Long. 116 deg. 53.24. Receiving set-up: 2 x BFR01 pre-amp to Microwave Modules transverter to FT101E at 28 MHz IF. Three foot horizontally polarized car mounted dish. Transmitter: FT101E to MM transverter to 432 MHz, 10 watt output to varactor tripler, output 3W.

VK5MC was located at Hatherleigh near Millicent, Lat. south 37 degrees 28.55, Long. 140 degrees 15.05. Receiving converter to Drake KRC receiver. Antenna 28 foot dish. Intended for EME. Transmitter 432 MHz driver to 3CK150A5 tripler, about 10 watts output.

Also on 29-12-78 at 1320Z David VK5KK at Waleysa worked Wal VK6KZ/P at 1296.03 MHz with signals S59. Distance 2024 km or 1258 miles. David used an MFR902 pre-amp to a Microwave Modules 144 MHz IF converter to a low noise 144/28 MHz converter to Drake 28 receiver. Antenna a one metre dish with circular horn feed 11 metres high, coax loss measured at 2.5 dB, ERP about 35 watts. Transmitter: Homebrew 432 MHz equipment (28 MHz IF) to varactor tripler with 1.1 watts output.

It should be noted both these contacts are over a longer distance than the previous record of 1170 miles. Power levels used were typically low, once again demonstrating the fantastic path which exists across the southern coastline of Australia. Some five VKs and three VKs have participated in two VKs two way contacts. Until now no one had added any distance to the previous record.

BACK ISSUES OF AR

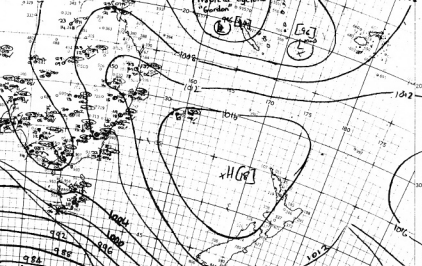
are normally available from March 1972 onwards although there are gaps here and there where certain issues are completely out of stock.

Please enquire for specific requirements.

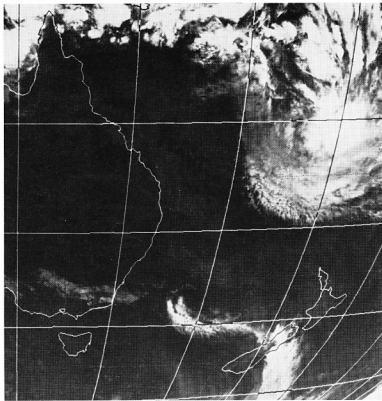
	each
PRICES:	
March-May 1972	30c
June 72-December 73	40c
January-October 74	50c
Nov. 74-Aug. 75	70c
September 75 onwards	90c

POSTAGE: Please add, on average weight 120g per copy.

WRITE TO: Box 150, Toorak, Vic. 3142



Synoptic Chart 2100Z, 8th and 9th January 1979, showing stationary high pressure area which caused VHF/UHF opening.



Satellite infra-red photo showing high cloud associated with fronts and cyclone on 7th January 1979, 2100Z.

Chart and satellite photo supplied by courtesy of Bureau of Meteorology, P.O. Box 1289K, Melbourne 3001.

TRANS-EQUATORIAL PROPAGATION

Tests have been carried out between Southern Africa and the Mediterranean Region of Europe on both 50 MHz and 144 MHz.

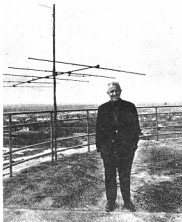
The results have been encouraging particularly on 144 MHz where several contacts have taken place.

Transmitter powers of 100 watts to 250 watts have been used with antennae of from 9 to 48 elements.

Tests are continuing particularly during the equinoxes and contacts between ZEZJV in Rhodesia and 5B4WR in Cyprus and SV1AB, SV1CS and SV1DH in Greece have taken place.

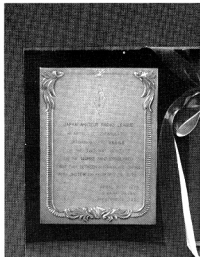
Six metre tests are hampered by the non-availability of 50 MHz in Europe. Some preliminary moves have been made to obtain a segment and listening tests are being carried out.

This information has been extracted from a very interesting article in Short Wave Magazine for August 1978.



Serge F8SH with the 50 MHz array used in TEP and Trans-Atlantic tests. From Lannion, France.

JARL plaque presented to VK8GB — see
Cover photo.



SOME NEW YEAR SPECIALS FROM BAIL ELECTRONIC SERVICES

Please note that some items are in limited quantity, so—don't delay, they won't last forever!

FT-101E AC-DC HF Transceiver	\$845
FT-101E AC HF Transceiver	\$795
101E DC-DC Conv. Kit	\$60

N.B.: Our 101E Transceivers still include the superb "B" Model adjustable Noise Blanker PB 1292, exclusive to us! The N.B. that really does work. And for those with the PB 1582 N.B. we can supply the 1292 at \$42, plus postage \$1.50.

FT-101 W/S Maintenance Manuals	\$27 plus P.P.	\$2.00
FT-901DE HF Transceiver (four only)		\$995
FT-7 HF Transceiver	\$389 (Yes, fair dinkum!)	
FT-227R 2m FM Digital		\$339
FL-2100B linear		\$579
FL-110 linear		\$199
YC-7B Dig. adaptor for FT-7B		\$125
AM filters for FT-101 and FR-101		\$45
FRG-7 Receiver		\$349
Battery holder for FRG-7		\$10
LFC-2A Selective SSB filter for FRG-7		\$20
YC-500S Counter 500 MHz		\$499
YC-500E Counter 500 MHz		\$656
YP-150 Dummy load/power meter		\$112
SP-101B Ext. speaker for 101E		\$49
CW filters for FT-101		\$59
FT-301 series CW, AM, RF Proc. filters	each	\$45
FRG-7000 Dig. Receiver		\$645
QTR-24 World Clock		\$35
YH-55 Yaesu Headphones, 8 ohm		\$19
YD-844 and YD-148 dual impedance desk mics, 600 ohm/50K ohms		\$49
YO-301 Monitorscope, three only		\$299
RS Series Yaesu HF Gutter mount mobile Antennas—RSM2 base, inc. RSE2A stub mast, with Co-ax. cable attached		\$29.90
Resonators—RSL-3.5 \$22, RSL-7 \$21, RSL-14 \$20, RSL-21 \$19, RSL-28 \$19, RSL-145 (5/8 2m) \$24.		
6JS6C P.A. Valve FT-101		\$11
Other Yaesu valves also available.		

70 T.V. Transverter 430 MHz (two only)	\$299
SRC-146A Standard (Japan) 2m hand-held 5 chan. 2W FM transceiver, built-in mic., spkr., "S" meter, inc. carrying base and crystals, to clear	\$199
Base adaptor	\$23
Also available Rubber ant., optional hand mic., mobile adaptor, Nicad batteries.	

ROTATORS:

103 LBX \$165, 502 CXX \$255, 1103 MXX \$410, 201 AX \$179, 1102 MXX \$379.	
---	--

MAST CLAMPS:

For 103 \$18, 502 \$29.50, 1102 and 1103 \$45.

L.P. FILTERS:

LP-7 \$6.50, TV-42 \$15, TV-476 \$10, FF-501DX \$39.

ANTENNAS:

TH6DX \$295, TH3JR \$195, Hy-Quad \$237, VS-33 \$259, DX-33 \$235, DX-32 \$145, DX-34 \$265, VS-22 \$179, VS-20CL \$165, VS-11CM \$89, VS-41/80KR \$119, VS-RG \$29, 18V \$40, TD-1 \$68. (Note: The Hidaka "VS" beams inc. balun.)

Hy-Gain BN-86 balun	\$28
Lightning Arrestors	\$4.95

ANT. COUPLERS:

HC-75 \$65, HC-250 \$89, HC-500A \$119, HC-2500 \$199. Yaesu Couplers also stocked.

SWR METERS:

RS-101 \$7.50, SWR-40 \$15, SWR-200 dual \$75, FSI-5 dual \$29.

MORSE KEYS:

HK-708 \$14.99, HK-706 \$25, HK-808 \$85, Morse osc. EKM-LA \$13.90. Practice set TC-701 \$19.50.

The above list is not complete. There are many more items available. Contact us for your requirements.

Above prices (R.R.) inc. S.T. Freight is extra. Prices and specs. subject to change. 90 day warranty on sets, excluding power valves and power transistors. Full service facilities and comprehensive range of spares.

All items new, ex stock except FT-7 and FT-227, which are due into store approx. mid-February.



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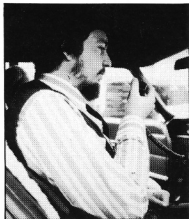
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FRG-7000 deluxe HF receiver Cat. D-2848 \$695.00

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FL-2100B 1.2kW linear Cat. D-2546

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FC-901 new antenna tuner Cat. D-2855

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QTR-24 world clock Cat. X-1054 \$37.50

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★ Cat. D-9050 usually \$3.95

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\$395.00

FT-227RA with up/down scanner.

Cat. D-2891 \$445.00

CPU-2500K 25 watts, keyboard mic, 4

memories & scanner. Cat. D-2889 \$575.00

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★★★★★★★★

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GORE HILL STORE ONLY: One only TS-820 with digital

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RSL-7 40m mobile whip Cat. D-4112

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RSL-14 20m mobile whip Cat. D-4114

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RSL-21 15m mobile whip Cat. D-4116

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RL-28 10m mobile whip Cat. D-4118

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18AVT 80-10m trapped vertical

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Cat. D-4304 \$199.00

TH3MK3 large 3 element beam

Cat. D-4306 \$299.00

TH6DXX 6 element thunderbird

Cat. D-4308 \$399.00

BN86 balun Cat. D-4300

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(only available with a Hi-Gain antenna purchase)

Accessories

Shinwa 500W L.P. filter Cat. D 7080

\$19.50

Viking 5Kw L.P. filter Cat. D-7086 \$37.50

1 ton 11 rugged coax relay Cat. D-5210

\$44.50

small egg insulators Cat. D-5300

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Sorry to have to announce an increase in our KENWOOD accessories prices, which took effect already in December last year. Due to the long lead time for advertisement texts we could not include those in our last two ads. However we can still sell the TS-520-S and TS-820-S transceivers at the old prices and really consider them now by far the best values for your money.

All HY-GAIN antenna models mentioned below are available ex-stock. In the last 3 months of 1978 we have imported \$100,000 worth of HY-GAIN antennas and in this way can obtain price breaks and pass the benefit on to our customers, to whom at least we do not have to explain and justify a price drop of from \$399 to \$299 for the TH60XX! We also continue to supply ALMINOX anti corrosion chemical with our antennas.

HY-GAIN ANTENNAS:

18-AVT/WB 10-80M vertical 23' tall	\$125
TH6-DXX 10-15-20M senior 6 el. Yagi 24' boom	\$300
TH3-MK3 10-15-20M senior 3 el. Yagi 14' boom	\$240
TH3-JR 10-15-20M junior 3 el. Yagi 12' boom	\$175
204-BA 20M 4 el. Tiger Array 26' boom	\$230
HY-QUAD 10-15-20M full size Cubical Quad	\$260
2M 5 el Yagi with balun 6'3" boom	\$25
2M 8 el Yagi with balun 12'6" boom	\$30
2M 14 el Yagi with balun 15'6" boom	\$40
BN-86 Balun for HY-GAIN beam buyers only	\$20
BU-5 Balun suitable for 10M beams	\$14

ANTENNAS SUITABLE FOR 10M:

11M 5 el. Yagi 17' boom	\$70
11M G.P. with 3 radials	\$20
CLR 2 11M 1/2 wave vertical w/3 radials 19'10"	\$40
CLR 11M 1/2 wave vertical w/4 radials 22'9 1/2"	\$50

ACCESSORIES & COAX CONNECTORS:

SWR-50A Twin meter 3.5-150MHz 1KW	
SWR/Pwr meter	\$26
Bumper Mount with 3/8" 24 thread antenna mount	\$7
Gutter Mount with 3/8" 24 thread antenna mount	\$4.50
5M length RG-58U with PL-259 one end	\$3
M-ring body mount	\$3
GLP Right angle RG-58U to SO-239 w/lock nut & weatherproof cap	\$3.50
MLS Right angle RG-58U to PL-259	90c
PL-259 standard & solderless, RG-8U & RG-58U	75c
In-line splice RG-8U & RG-58U	75c
SO-239 chassis connector 2 & 4 hole mounting	75c
Right angles & T-connectors	\$1.50
Double male & double female connectors	80c
Mic. sockets, chassis & in-line, 3 & 4 pin	85c
3 circuit microphone jacks	85c
Crystals for QUARTZ-16 2M transceiver:	
Channel 51 T/R 146.55 — pair	\$5
Channel 64 T/R 147.20 — pair	\$5

ROTATORS & CABLES:

KEN KR-400 rotator with 28V AC control box	\$125
CDR HAM III rotator with 28V AC control box	\$175
No. 14 hard drawn copper wire — per meter	10c
3/4" H.D. foam coax extra low loss — per foot	\$1
Type RG-8U foam coax cable — per yard	80c
Type RG-58U coax cable — per yard	30c
8 core rotator cable — per yard	65c

KENWOOD PRODUCTS:

TS-520S 10-160M SSB/CW transceiver 240V AC	\$700
TS-820S 10-160M SSB/CW w/Digital readout	\$1100
TL-922 10-160M Linear Amplifier	\$1200
TS-700SP 2M all-mode transceiver	\$850
TR-7400A 2M transceiver	\$500
TR-7500 2M transceiver	\$350
DG-5 Digital display for TS-520S	\$250
TV-506 6M transverter	\$250
TV-502 2M transverter	\$300
AT-200 Antenna matchbox	\$175
DS-1A DC-DC converter	\$75
DK-520 adaptor for DG-5 to TS-520 use	\$20
LF-30A low pass anti-TVI filter	\$30
VFO-820 external VFO for TS-820S	\$185
VFO-520S external VFO for TS-520S	\$160
SP-820 external speaker for TS-820S	\$60
SP-520 external speaker for TS-520S	\$30
YG-88C CW filter for TS-820S	\$55
YG-3395C CW filter for TS-520S	\$55
MC-10 hand held microphone	\$20
MC-50 desk microphone	\$45
HC-2 Ham clock	\$35
SM-220 Station monitor	POA
BS-5 (TS-520S) & BS-8 (TS-820S) pan adaptors for SM-220	\$65
TS-120V 12V DC mobile transceiver with NB, VOX, IF Shift & digital readout, 30W PEP	\$600

NOVICE SPECIALS: Still available at these low prices

Transceivers for 10M coverage, AM/USB, 15W PEP:

- (a) SIDEBAND SE-502 240V AC/12V DC w/inbuilt SWR/RF meter 28.3-28.6 MHz
- (b) UNIVERSE 224M 12V DC 24 ch. 28.480-28.595 in 5 KHz steps Clarifier operates on both transmit & receive

Set of Crystals for Amateur license holders for converting 23 ch. 27MHz CB units to 28MHz, suitable SIDEBAND, UNIVERSE, KRACO, HY-GAIN etc. SSB/AM units:

Sets of 8 crystals converts to 28.480-28.595MHz .. \$40

SUNDRIES:

FRG-7 5-30MHz General coverage receiver	\$350
FT-7 10-80M 12V DC transceiver	\$525
ICOM IC-202 2M SSB portable transceiver	\$175

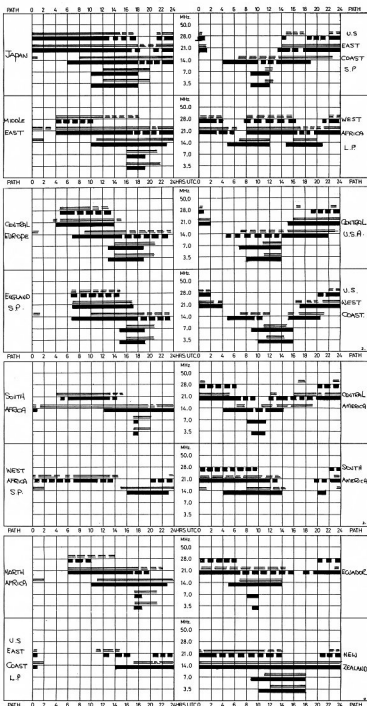
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Radio Communications*	14.25
CQ-TV*	4.50
Break-In	11.00
VHF Communications	7.20 (Air Mail \$10.40)

*Please ask for membership form beforehand.

● **BACK ISSUES** of VHF Communications are normally available from stock except 1969 issues which are out of print. Single copies are \$1.10 each to 1974, \$1.40 each from 1975, \$1.70 for 1977 and \$1.80 for 1978 (average weight of each is 90g); VHF Communications binders to take 12 issues are \$2.75 each and weigh 250g.

● **BACK ISSUES** of other magazines are not available but sometimes can be obtained against special order.

● **BACK ISSUES** of Amateur Radio are available to members. Some issues are out of print however. Issues March to May 1972 at 30c each, June '73 to Dec. '74 at 40c each, Jan-Oct. '74 at 50c each, Nov. 74-Aug. '75 at 70c each, Sept. '75 onwards at 90c each. Calculate average weight as 120g per issue.

● **AMATEUR RADIO** is available on overseas subscription at \$10.80 for 1979. It is also available at this rate for libraries and organisations such as Government Departments, Schools, etc. All these are post paid by surface mail.

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VK6RU	327/359	6TW	121/123
5MS	324/356	4NQ	120/124
4KS	324/341	4AAU	120/121
6MK	315/342	6IH	120/120
3AHQ	304/326	4LZ	119/123
6LK	354/313	3IF	118/122
4UC	301/306	4UA	118/120
2APK	300/313	3BBA	117/121
4FJ	297/324	3BHN	116/116
4PX	297/304	6DR	115/118
5AB	295/318	2AZY	115/117
4RF	289/283	5EF	114/119
7OK	286/292	1ACQ	113/118
22KA	274/281	2YO	116/110
3ACD	273/281	2TA	109/112
2AHH	265/280	3WT	109/109
2SG	265/271	2EB	108/110
3TL	264/277	3BCY	108/110
3JF	263/266	6NCZ	107/107
3AMK	258/265	3DF	106/109
4DO	257/274	3WU	105/105
4AK	258/258	3AYF	104/106
4VC	255/264	3LC	103/107
4CZ	255/258	5OZ	103/107
3VK	252/256	2SK	103/104
6LC	230/254	3GI	103/104
5WV	248/253	3PR	103/103
4VU	233/234	3WV	103/103
3HL	228/240	8KP	102/106
5RX	226/226	9WD	102/106
6CW	220/224	3NM	102/102
3ALM	217/221	4AWR	102/102
3SM	203/210	6BV	102/102
3TG	198/206	3XO	101/104
4XJ	192/200	4ZK/9	101/104
5BB	188/193	3SO	100/104
9QI	188/180	5QB	100/103
2AML	179/181	6WY	100/103
6KK	174/178	3HE	100/102
7LZ	173/184	4JS	100/102
7CI	153/156	3DU	100/100
3ZD	152/156	3AGB	100/100
4PJ	150/153	3AUL	100/100
1VP	148/152	4YU	100/100
6HE	148/150	3AKZ	99/105
2APW	148/148	2AXI	99/103
35X	143/148	2GV	99/102
3JM	139/143	3ADO	99/102
2AGO	137/142	3KD	99/101
4DZ	131/134	3CR	98/101
7JV	127/130	3WR	98/101
4OA	126/130	2NM	97/100
3QV	125/127	2AMU	95/103
3ZY	121/125		

CW

VK2EO	317/346	3AXK	200/218
2OL	310/339	4SD	187/206
3AHQ	308/331	4QD	172/178
3YL	302/325	5BO	163/181
4FJ	297/329	3AX	149/162
2APK	291/304	4XJ	147/157
3KS	280/300	2QK	142/146
4RF	271/288	2SD	139/147
3NC	268/297	2AHH	137/150
6RU	267/296	4KS	130/138
4XJ	261/266	3SR	127/133
3YD	258/281	3LV	122/126
3TL	248/260	3HL	116/121
3RL	245/265	5XK	144/122
245/264	4PZ	104/112	
5RX	223/236	4LV	103/106
3JF	208/219	2GR	101/105
7LZ	203/229	8HA	97/101
4DO	202/224		

OPEN

VK6RU	327/359	3AXQ	130/134
4KS	325/340	2AXK	129/136
4SD	318/339	3LV	127/131
6MK	315/342	4EZ	127/131
2VN	311/336	6JK	135/136
2APK	311/329	6TW	125/127
4FJ	309/341	2AFA	124/127
3AHQ	304/326	4LZ	129/124
4PK	304/315	1ACQ	117/122
4UC	304/310	8KP	116/121
3YL	303/326	5EF	114/119
4RF	302/319	4DV	111/115
2SG	301/311	9TB	110/114
5RK	288/301	3ABA	108/115
286/308	3YV	107/121	
3JF	281/293	6FI	107/107
3TL	280/293	5FY	105/112
2AHH	273/292	5EJ	105/108
3ACD	273/282	4UG	105/106
3NC	269/298	3PR	105/105
4QD	265/289	3AUT	105/105
4KX	265/270	6MA	105/105
3JA	262/289	3SO	104/108
4AK	259/261	3XD	104/107
3AMK	258/265	4YG	104/104
3HL	253/268	2AFQ	103/103
3KS	243/254	3NAC	102/102
7LZ	233/259	8AP	101/102
4XJ	223/234	9BA	101/104
5QI	206/209	3AUL	101/101
7BC	205/205	2PA	100/112
2BC	197/200	2PF	99/103
6KK	191/197	2BRK	99/103
4GB	188/196	2AND	98/102
6HD	186/191	1OL	98/100
3HE	170/175	4JI	97/100
35X	151/157	4QF	96/100
3QV	141/145	3ACS	93/101
4NQ	132/136		

The first group of figures represents the total number of current countries, the second includes those countries which have been deleted.

The order is determined by the number of current countries worked; if two stations have the same number worked, then it goes on the second group of figures, and if this is identical then it goes on the States in numerical order.

THE WESTERN KEYBASHER'S AWARD OF

PERSEVERANCE -

Barry Ross VK6IF
(Secretary, AARTG)

The Western Keybasher's Award of Perseverance is offered to all Amateur or Short Wave Listeners who have contacted, or in the case of SWLs printed, to Western Australian amateurs on RTTY on any band. It is hoped to encourage the seeking of VK6 amateurs by other states and possibly other countries. Also available will be various endorsements such as all on one band, QRP working etc.

Conditions will be—

1. Contacts with all WA amateurs with either full or "Z" calls are permitted.
2. The only mode permitted is RTTY.
3. Only one (1) contact per WA station is allowed to count towards the Award.
4. All contacts must be two way RTTY contact except for the SWL class.
5. All contacts must be listed showing date, time and frequency and should be verified by one other amateur who should sign the log as well. QSL cards should not be sent.
6. All contacts after the 1st of July 1978 are eligible.
7. Cross band or cross-mode contacts are not countable.
8. A fee of \$1.00 should be enclosed to cover postage etc.
9. Members of the AARTG are permitted to apply for the award.

RTTY contacts are not so easy to come by as phone or CW contacts so to work 10 WA amateurs should require some persistence on the part of the other station. All enquiries should be made to the Secretary, Australian Amateur Radio Teleprinter Group, G.P.O. Box 9002, Perth, 6001, W.A. From AARTG Quarterly Newsletter No. 11.

HMS BELFAST IMPERIAL WAR MUSEUM

Issue of Special Amateur Radio Callign

The amateur radio station aboard HMS Belfast moored in the Pool of London, between Tower Bridge and London Bridge, has been granted the use of the special callign GB2RN for use when the ship is open to the public. Summer hours 1100 to 1800, winter hours 1100 to 1630, all times British local time. The station is interested in establishing schedules with other museum and special interest stations worldwide, these and other stations requiring skeds, please contact G3HZL, Don Walsley, 153 Worple Road, Isleworth, Middlesex, TW7 7HT, England.

All HF bands from 1.8 to 28 MHz are covered. CW or SSB, it is hoped to have RTTY in the near future. G4HMS will be operational outside of the stated hours.

RNAS MERCURY AWARD

For contacts with member stations of the RNARS on a points basis, one point per station per band, double points for contacts above 30 MHz.

Special stations count double points, G3BZU, GB2RN, GB3RN, GB3RM, GB3FAA, GB3HMS, GB3GUZ, GB3RNR.

Award is issued in three classes: CLASS ONE — 20 points; CLASS TWO — 10 points, not available to UK stations; CLASS THREE — 5 points, not available to UK or Europe. Endorsements for AOB or mode, plus extra 10 points. Application with £0.30 sterling or 6 IRC to Award Manager G3HZL, 153 Worple Road, Isleworth, Middx, TW7 7HT, England. Certified log data only, no QSLs required, award available to SWLs.

BOOK REVIEW

1000 Questions for Novice Licence Candidates by Ken Hargreaves VK2AKH, Dave Wilson VK2ZCA / MNW, Rex Black VK2YA.

This book contains 1000 questions of the multiple choice type complete with answers. The questions cover both theory and regulations for the novice licence.

The book is intended to give intending novices an idea of the sort of questions which they will encounter in the exam. This is very necessary and P&T do not meet a book such as this one because

The book goes a long way to meeting the needs of novice candidates and their instructors for a ready source of typical questions. Indeed the compilation and checking of such a work is a daunting task. The authors deserve credit for tackling the job and carrying it out so well.

There are some typographical and other errors but they are a very small percentage and say a lot for the care and hard work that have gone into the book.

Those novice candidates and novice course instructors requiring a copy or copies should write to—

WIA NSW Education Service

PO Box 109

Toongabbie NSW 2146

The price is \$3 each with special arrangements for class purchases.

Also available from the above address are a range of tests and Morse tapes at very attractive prices so send an SASE for details.

FROM THE OVERSEAS ADS

The new linears are all falling in line with the American FCC requirements and 10 metres seems to have all but disappeared from the linear band-switch.

Dantron have a new DTR002L using an Elmac 8877 valve and covering 160 metres to 15 metres. A nice looking unit. Henry Rath has brought out their 1K05 which uses the Elmac 3-500Z triode. This model is more compatible with Australian power limits. Also 10 metres is included on their export models.

Swan have announced their 100 MC transceiver which is a small transceiver with a very neat appearance. It is complemented by a matching AC power supply and an antenna tuner.

Ten Tec have released a neat new transceiver in their OMNI model with either a digital or an analog dial. Looks like all the new solid state transceivers have abandoned integral antenna matching. That outboard antenna tuner is a bit of a step back with two handed band switching. The old tune and load controls did give a bit of leeway for other than 50.00 ohms and zero reactance feedlines. After all most aerials aren't that good.

Well that brings us to aerials and Hygain have got back in with a range of 5 element monobanders. For 20 metres the 205 BA; for 15 metres the 155 BA; and for 10 metres the 105 BA. Should be most impressive. From PFT come the Tonna range of 144 MHz and 432 MHz yagis which combine high performance with low weight and wind load. KLM are anticipating WARC79 with a range of log periodicals.

20 YEARS AGO

Ron Fisher, VK3OM

MARCH 1959

March 1959 brought two important events, one Federal and one State. The Silver Anniversary Convention of the WIA was working hard to prepare the brief for the forthcoming ITU conference at Geneva. It appeared that there would be enough finance to send our own delegate, and liaison had been taking place between the Institute and other major radio societies of the world so that a common policy for the Amateur Service might be achieved. In Victoria, a new home had been found for the WIA at 473 Victoria Parade, East Melbourne. March 1959 issue of Amateur Radio described the new property and also traced the history of the various locations that the Institute had been housed in.

Technical articles for March included: "AC Power Supply for the No. 22 Set", C. S. Rann VK5AAK described his heavy duty 12 volt DC power supply to power the popular disposals transceiver. Regulation consisted of a series resistor switched with a relay to reduce the voltage when the current drain reduced on receive.

Les Jenkins VK3ZCN described a simple noise limiter for mobile work. A 6AL5 double diode was shunted across the last IF transformer primary with apparently good results.

A reprint from QST, subtitled: "Become a Bridge Expert in one Easy Lesson", showed what an SWR bridge can and cannot do. For those who still consider the SWR meter as the end all for antenna measurements, this would be excellent reading today.

If you have a BC457A under the bench but it is not sure what it is, have a look in March 1959 AR. Noel Sinnbeck VK2OU presented a long list of surplus radio gear with a brief description of each.

Note that the new Geloso VFOs had been released. The 4/103 for two metres and the 4/104 for 80 through 10 metres and including the 11 metre band. The two metre model wisely provided for crystal control with the VFO to be used for calling only. I believe that it drifted somewhat.

CONTESTS

Wally Watkins VK2ZNN/NCU
Box 1065, Orange 2800

FEBRUARY

10-11 BERU
10-11 JOHN MOYLE MEMORIAL FIELD DAY
4 and 11 TEN TEN NET QSO PARTY
24-25 FRENCH PHONE CONTEST

MARCH

3-4 ARRL DX PHONE CONTEST
17-18 ARRL DX CW CONTEST
24-25 CQ WW WPX SSB CONTEST
24-26 BARTO RTTY CONTEST

TEN-TEN NET QSO PARTY

0000-2400 GMT February 4 and 11.

EXCHANGE

Call, 10X number, ARRL section and name.

CLASSES

Single operator, multi operator and QRP. Max. 20 watts PEP output.

SCORING

DX contacts 2 points, add 1 point if with 10X number. QRP 2 points plus 2 points with 10X number.

Certificate will be awarded to Australian winner. Logs from members only to: Robert C. Mughieris, WATIAKS, P.O. Box 168, Randolph, Mass., 02368. (Full rules from FCM with SASE).

COMMONWEALTH CONTEST 1979 "BERU" — RULES

TIME:

1200 GMT Saturday 10th March to
1200 GMT Sunday 11th March.

MODE:

CW only 3.5 to 28 MHz. Call is CQ BERU.

Eligible stations are radio amateurs licensed to operate in British Commonwealth call areas. In our region, Lord Howe VK2, Willis VK3, Christmas VK9, Cocos VK9, Norfolk VK9, Heard VK0, Macquarie VK0, and Australian Antarctica VK0 as well as VK1-VK8 are all separate contest areas.

SCORING:

5 points per contact exchange (RST 001 etc.): 20 bonus points for 1st, 2nd and 3rd contact with each call area other than one's own, on each band. There are 111 areas in all, with G, GW, GD etc. counting as a single area.

LOGS:

Separate logs are required for each band showing columns —

1. Date and time GMT.
2. Station worked.
3. No. sent.
4. No. received.
5. Band.
6. Leave blank.
7. Contact points claimed.
8. Bonus points.

Each band log should be separately totalled and should include at the end a check list showing areas worked and number of contacts per area. Separate band totals should be added together and the total claimed score entered on a cover sheet giving particulars of station, QTH, equipment, power, antenna and a declaration that the rules and spirit of the contest have been observed.

Entries may be single or multiple band. Single band entries should claim contacts on one band only, but submit details of contacts on other bands for checking only. Entries should be addressed to:

D. J. Andrews G3MXJ,
18 Downsview Crescent, Uckfield,
East Sussex, England, TN22 1UB.

Closing date: 14th May 1979 (by airmail, please).

AUSTRALIAN SCORES

23	VK4XA	3295	79	VK3MR	981
27	VK2GW	3080	80	VK8NT	968
34	VK7RO	2473	81	VK5FG	950
35	VK3CZ	2460	84	VK3YL	860
39	VK7CH	2340	88	VK5MD	820
40	VK3MJ	2321	91	VK5SW	755
45	VK7BC	2215	91	VK8GJ	766
48	VK6AQ	1985	93	VK3YD	738
56	VK3RJ	1735	95	VK2BDU	730
61	VK7JB	1575	100	VK7RY	630
62	VK3YK	1538	102	VK4XJ	600
63	VK3AOF	1525	109	VK4UR	405
65	VK7BR	1505	112	VK2BL	366
65	VK6ED	1515	114	VK3XB	225
67	VK3KS	1240	116	VK5NL	150
75	VK5BO	1058	119	VK7ZO	115

Single band entries among the above were:

3.5	MHZ	VK5NL	Overseas leader, VK7ZO
7	MHZ	VK2BL	
14	MHZ	VK3MR	Overseas leader, VK8NT, VK3YD, VK4XJ.

ZLs other than ZL3GO figured prominently:

11	ZL2BCO	4545	54	ZL1HV	810
12	ZL2BR	4481	83	ZL1AZ	808
20	ZL1AIZ	3695	113	ZL2MM	320

also: 85 P29EJ 855

AUSTRALIAN AWARDS

The Silver Medal for the leading VK entrant was won by Russ Coleston VK4XA, while the middle placed Bronze Medal was won by "BO" Williams VK5BO.

How the leaders made their scores — Scoring details, QSOs/Bonus areas per band 80 to 10:

ZL3GO	35/29	95/40	208/55	150/44	53/37
VE7CC	30/24	95/46	155/51	121/38	37/31
VE3KZ	18/17	91/36	155/54	150/35	96/23
VK4XA	0/0	34/26	119/49	37/27	13/12
VK2SW	11/10	50/34	63/44	30/19	9/9

VK4XA was unfortunate in that, having set the Sunday night for 90 metres, his power supply blew up with a few hours to go. The above figures are a reflection of band conditions in VK as compared with VE and ZL.

RSGB COMMENTS

The long-awaited improvement in band conditions at last appeared during this contest, bringing with it higher scores and QSO totals, and an increase in overall entries. Especially pleasing were the 28 MHz openings and, for Europe, the long 7 MHz opening to the Canadian west coast.

The top two positions this year go to the same stations as in 1977, although Peter Watson ZL3GO, increased his margin with a score that put him well ahead of the field. There were many comments from all areas on his outstanding and consistent signal on all bands, and mention should be made of his extensive antenna farm which consists of 3/4/5 el. quads for 14/21/28 MHz and a 160m dipole at 100 ft. for the lower frequency bands. In second place was Lee Sawkins VE7CC who made 438 QSOs. For yet another year (the sixth in succession) Al Slater G3FXB, the Col Thomas Rose Bowi as the leading entrant from the UK.

The only band to attract many single-band entries was 14 MHz. Here, as in recent years, Stuart Jason G4CNY was the leading UK station. He made 142 QSOs using a T4XC/R4C combination and a 2 el. quad. The overseas leader on 14 MHz was M. Campbell VK3MR who had a total of 90 QSOs.

The HF Contest Committee was disappointed to see the continued decline in the number of entries to the receiving section and would welcome suggestions on how this could be improved. The small entry, however, in no way detracts from the win by Ron Thomas BR515822, who managed to double his score of last year and, in so doing, put an end to the winning run of Eric Trebilcock BR5195, who has to be content with second place this year.

Many stations will notice that in the tabulation they have suffered a reduction in their claimed scores in common with all RSGB events. The Commonwealth Contest is subject to detailed log checking. Especially damaging to a score can be an error in call sign, which loses all points (QSO and any bonus) to both sides of the QSO. Even worse are unmarked duplicate contacts, of which the committee takes a very poor view, and de-

COMMONWEALTH CONTEST 1978 — RESULTS

The following is extracted from the RSGB results of the 1978 Contest:

	points
1	ZL3GO 6677
2	VE7CC 5821
3	VE3KZ 5687
4	VE5RG 5477
5	9H1EL 5393
6	VE3AKG 5249
23	VK4XA 3295

RECEIVING SECTION

2 Eric Trebilcock BR5195 2405 points.

ducts up to three times the number of points claimed. Other errors — mistakes in reports or serial numbers — lose a proportion of the points claimed. The implications for care during the contest and checking of the entry should be obvious.

The committee was pleased to receive comments and suggestions with the logs and these will be considered in due course. Suggested changes to the rules included additional bonus points for each UK prefix and a longer period for the contest — possibly 24 or 30 hours out of 36 with a rest period. Over recent years, with the decline in activity from the razor call areas, particularly in Africa, this contest has become very much a G/VE/VK/ZL affair but, despite this fact, it still remains a very popular event, as evidenced by many log comments. It is hoped that the rise in the number of entries continues in future years.

Note: No changes have been made in the rules for 1979. See this issue AR.

WICEN

Ron Henderson VK1RH
Federal WICEN Co-ordinator,
53 Hannaford St., Page ACT 2614
Ph. (062) 54 2059, A.H.

DATE TIME GROUPS AND TIME ZONE SUFFIXES

Date Time Groups (DTGs) are used in message writing and instructions to uniquely define a particular time and date; for example 12 noon GMT New Year's day 1979.

DATE, TIMES

Date time groups are normally written as digits, the first two being the date and the final four the time, using the 24 hours clock. These are usually followed by a time zone suffix letter and can be subscripted as necessary with month and year. Hence our example becomes 011200Z JAN 79.

ZONE SUFFIXES

When it is necessary to connect local mean time with Greenwich Mean Time, the zone suffix system of expressing time is used. It is particularly necessary when dealing with places keeping different local time. The system is as follows:

(a) Variations of local mean time from Greenwich Mean Time (GMT) are denoted by adding the appropriate suffix letter to the date/time group as follows:—

Number of hours local mean time is ahead of GMT	Zone suffix	Number of hours local mean time is behind GMT	Zone suffix
1	A	1	N
2	B	2	O
3	C	3	P
4	D	4	Q
5	E	5	R
6	F	6	S
7	G	7	T
8	H	8	U
9	I	9	V
10	K	10	W
11	L	11	X
12	M	12	Y

GMT is denoted by the suffix Z

(a) Thus 1800 hours Eastern Australian Summer Time becomes 1800L or 0700Z.

(b) Where the local time is an odd multiple of half-an-hour ahead or behind GMT, a two-letter suffix is used, e.g., 1500 hours SA standard time which is 9½ hours ahead of GMT would become 1500K, or 0530Z.

From a WICEN point of view we will often get messages with DTGs in the preamble and all WICEN exercise instructions should use DTGs to enable members to gain experience and to eliminate any chance of confusion.

DIVISIONAL NOTES

VK2 DIVISIONAL NOTES

Notice is given of an Extraordinary General Meeting of WIA-NSW Division to be held on 23rd March 1979 at the Wireless Institute Centre, 200 hrs. Details are in February "MB" and include

suggested disposal of WI fee, constitutional matters and vote of no-confidence.

The Annual General Meeting of the VK2 Division of the WIA will take place on Friday, 6th April, 1979. The successful candidates for Council will be announced at this meeting. Nominations are sought for Councillors of the Division and these must reach the office of the Institute, 14 Atchison St., Crows Nest, no later than 21st February, 1979.

All nominees must be full members of the Division as must be the proposer and seconder of the nominee. On reception of more than seven nominees ballot papers will be forwarded to full members in early March. These ballot papers must be returned to be received by the Administrative Secretary, 14 Atchison Street, Crows Nest no later than Thursday, 5th April, 1979.

The following format may be used in nomination of a member for Council.

I _____ hereby agree to nomination as member of Council of the N.S.W. Division of the WIA.

_____ (Signature) _____ (Date)

I _____ wish to propose _____ for nomination as a member of Council of the N.S.W. Division of the WIA.

_____ (Signature) _____ (Date)

I _____ wish to second _____ for nomination as a member of the N.S.W. Division of the WIA.

_____ (Signature) _____ (Date)

Full licensee call signs have now reached the "D" series of suffixes — i.e. VK2DAA.

N.S.W. Division members are notified that the Annual General Meeting of the WIA New South Wales Division will be held in the Wireless Institute Centre on Friday 6th April 1979 from the normal time for meeting (usually 19.30). Nominations for Councillors (a form was included as part of the January Minibulletin) must reach the Institutes' registered office no later than 21st February 1979. Ballot papers, if these are required, will be sent out early in March and are to be returned to the registered office by 5th April 1979. All details were included in the January 1979 Minibulletin insert into Jan. 1979 AR.

VK3

The Midland Zone Convention will be held in Bendigo on Sunday 25th February from 10.00h at the Strathfieldsaye Hall.

GEELONG RADIO AND ELECTRONICS SOCIETY

The Geelong Radio and Electronics Society, VK3ANR, has recently been lived up by the forming of two groups, an RF group, and an AF group.

The following test equipment for use by members, is now on order, a CRO, a signal generator, a GDO and some general tools.

A printed circuit board workshop is now operating using preassembled board and excellent results are being achieved. The AOCF, LAOCF and NAOCF classes are held free of charge to members on Mondays at 7.30 p.m. and Syllabus meetings on Thursdays at 8.00 p.m. Visitors are welcome at the room on the Breakwater Road, Belmont Common, Geelong.

Address for Correspondence:
Geelong Radio and Electronics Society, VK3ANR,
P.O. Box 952, Geelong, 3220.

MAGAZINE INDEX

Syd Clark, VK3ASC

BREAK IN September 1978

A Six State Logic Probe; A Battery Eliminator for 12 volt Rigis; QRP CW Transceiver; Simple Conversion of Pye Galaxie Radio Telephones to 2m FM; ITV and TVI; 600 mHz Fox Hunting; Amateur Radio, What of It's Next; 50 Years.

CQ August 1978

Clipperton Island — A Dream Come True; A Versatile All-Band Antenna Tuner; One Last Crack at the Code; 1977 CQ WW DX Contest (Phone Results); Insurance and Your Radio; Building Enclosures for Small Units; The W2WV Data/Slope Antenna; Dummy Up for DX; The Night of the Igwana; Gimmicking a CB Mobile Antenna for Two Metre Use.

CQ September 1978

Results of the CQ 1977 WW DX Contest (CW); An RTTY Primer, Pt. 6; Clipperton Island — A Dream Come True, Pt. 2; The GR 821 RF Admittance Bridge, Pt. 2; An Effective 40 and 70 Metre Vertical Antenna; The RF Faucet; A Simple 2 Metre Mobile Antenna.

HAM RADIO July 1978

Non-Purpose VHF Receiver; Sub-audible Tone Encoders; Pseudo-Logarithmic Spectrum Analyser Display; Variable Voltage Power Supply; Radio Sounding System; Frequency Display for the Heath HW2036; Phase Locked Loops; Voltage Calibrator for Digital Voltmeters; Multi-Band J Antenna; Colpitts Oscillator Design; Visual Aids for Microcircuits; RFI Cures for Home Entertainment Devices.

OFT September 1978

The Remarkable but Little Known Vackar Meter; Designing a Vertical Antenna; Pre-Scaler Updates the DVM/Frequency Counter; An Auditory Dip Oscillator; A Solid-State Transverter for 70 cm; An Inexpensive Capacitance Meter; Direction Finding — European Style; JG10FW, First Solo Expedition to Reach the North Pole; Operation Outreach; Ask Not What Amateur Radio Can Do for You; Results, First Annual ARRL EME Competition; Results, FMT; Dawn of an Era; WARC 79; Moved and Seconded; Amateurs Look on Reconsideration of 10 Metre Amplifier Ban; We Are Not Alone.

GST October 1978

A Newly Discovered Mode of VHF Propagation; The Canadian Wonder; A 25 kHz Calibrator for the W3L Build This High Performance Top-Band Converter; SSTV Pictures from Your Microcomputer; Medium-Scan Television — A New Frontier; Build This Sardinie Sender; You and Your Log; How Safe is Your Ham Shack, Pt. 3; A Different Kind of Courage; Sweepstakes for the Little Guy; Try a Hamfest Code-Contest; They Made It — W5DDC/Double Eagle II; GST Abbreviations; 45th Annual Sweepstakes Announcement.

RADIO COMMUNICATION October 1978

Scrolling for the G3PLX VDU; A Colinear Antenna for Repeaters; Icom IC240 144 MHz Transceiver (Review).

RADIO 25 June 1978

How to Fit a Rotating Mast in a Tower.

RADIO 25 July 1978

Flat Lines for Flat Dwellers: How It All Began; The 10 Code.

RADIO 25 August 1978

Dual Purpose Battery Indicator; How It All Began; Common Repeater Problems.

SHORT WAVE September 1978

Antennas, The Weak Link, Pt. 5; Top Band for Next to Nothing; Memory Addition to G4C1 Morse Keyer; Courses for the RAE.

73 August 1978

Radio Row Revisited: How to Work Europe With an HT; What? CB Repeaters? A Complete X-Band Transmitter; Shock! The PVC Portable; The Amazing Mobile Life Preserver; Power Line DX; Ruddy Good Show; Rock Steady; In the Eye of the Beholder; The End of RF Feedback; The Heavyweight; Sleight of Hand; CB to 10; In Search of Stability; On Your Mark; A WVW Primer; The Swiss Fork Special; The End of the Rats Nest; 2001-3; The Calculating KIM-1; A No-Cost Digital Clock; The Basics of L-network Design; Hung Up on the Autopatch; Updating the Wilson 1402; Quick Check for TT Pads; The Op Amp Beam Heading Indicator; Super Charger; HW-101 Owners, Check This; Sitedone is a Must; The Tiny Tone Repeater Saver; Dispense It Right; Ham Radio is NOT a Rich Man's Hobby; The Eggled 22; Custom-Make Your Key Paddler; Don't Let Your Battery Die; New Life for Double Sideband; Time and Tide — Digitally; The Sneaky J; The End of Autopatch Embarrassment; The "Do It All" Digital Clock; More CW Fun With Break-In Keying; Poor Man's Cruise Control.

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FANTASTIC OFFER

YAESU FT-7



Limited quantity only.

\$299

Complete with mike, mobile mount and usual accessories.

Stocks should arrive Feb. Order yours **NOW** before they sell out.

Send cheque or money order to **CHIRNSIDE ELECTRONICS**



ICOM

IC-701, HF 160-10M Transceiver.....\$1369.
IC-202E, 55B Portable Transceiver.....\$229.
IC-225, FM 10 Watts 2M Mobile Transceiver.....\$309.
IC-211, ALL Mode 2M Transceiver.....\$770.
IC-280, Mobile 2M Digital Transceiver.....\$429.
IC-701PS, Power Supply.....\$275.

Special offer on

FT-101E

\$799 (AC only)



incl. RF Speech processor.
More effective noise blanker.

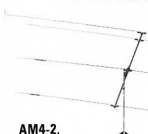
AC-DC Model \$879.

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Open Saturdays.

SUPPORT LOCAL INDUSTRY.

VERTICAL ANTENNAS.



12 month warranty.

AM4-2.

DUO BAND BEAMS NOW ONLY

\$149

AMV-5

80-10 M only

\$99

including radial kit.

YC-601, Digital readout Adaptor for FT-101E

\$279.



QTR-24, \$33.

YD-148 \$49.

YAESU

FT-901DM, 160-10M Transceiver.....\$1595.
FT-901DE, 160-10M Transceiver.....\$1305.
PV-901, External VFO for FT-901, 40 memories.....\$449.
FC-901, Antenna coupler incl SWR and PWR.....\$269.
YO-901, Monitor scope for FT-901, inc. pan adap. STBA.
TV-901, Transverter for FT-901, 6M, 2M, 70CM.....\$78A.
SP-901, External Speaker for FT-901.....\$53.
FT-101E, 160-10M Transceiver, ac only.....\$839.
FT-7, 80-10M Transceiver.....\$389.
FP-4, Matching Power Supply.....\$78.
FRG-7, General Coverage Receiver.....\$369.
FRG-7000, Digital General Coverage Receiver.....\$675.
FT-227R A, 2m, Mobile Transceiver.....\$389.
FT-225RDM, 2M, ALL Mode Transceiver.....\$595.
FL-2100B, 1200 Watt Linear Amplifier.....\$559.
FL-110, 200 Watt DC Input Linear Amplifier.....\$245.
QY-101, Monitor scope for FT-101E.....\$379.
YP-150, Dummy Load-Meter.....\$112.
YD-844, Desk Mic.....\$52.
YD-148, Dynamic Desk Mic.....\$49.
QTR-24, 24 hr. World Clock.....\$33.
FW-101B, Matching VFO for FW-101E.....\$155.
YC-500S, 500 Mhz. Frequency Counter.....\$530.
YC-500J, 500 Mhz. Frequency Counter.....\$389.
FTV-250, 2M Transverter.....\$329.
SP-101B, Matching External Speaker for FT-101E.....\$53.
YC-401, Digital readout Adaptor for FT-101E.....\$279.
FC-301, Antenna Tuning unit inc. SWR, Pwr meter.....\$239.
YO-301, Monitor scope.....\$319.
Optional Crystal Filter.....\$59.
FF-501, DX 2kW. low pass filter.....\$41.

ROTATORS

EMOTATOR Rotators have thermal cut-out for overload protection.

(kg./cm.)
Emoto model Torque
103 LBX 1,500
502 CXX 4,000
1102 MXX 10,000



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TS-520S HF Transceiver ac only.....\$759.
TS-820S HF Digital Transceiver ac only.....\$1179.
SP-520 Matching speaker for TS-520S.....\$37.50.
SP-820 Matching speaker for TS-820S inc. filters.....\$66.
VFO-820 Matching VFO for TS-820S.....\$165.
VFO-520 Matching VFO for TS-520S.....\$147.
SM-220 Monitor Scope Kenwood series.....\$329.
DG-5 Digital Display for TS-520S.....\$194.
DS-1A DC Converter for TS-520-820.....\$74.
DS-8 Pan Adapter for TS-520S.....\$60.
DS-8 Pan Adapter for TS-820S.....\$60.
AT-200 Matching Antenna Tuner Power meter.....\$184.
Optional crystal filters.....\$54.
MC-355 Hand Mike HI Z.....\$25.
MC-50 Base Mike HI and LO Z.....\$52.
TS-120 80-10M Mobile Digital Display 30W PEP STBA.
All Equipment pre-sales checked and wired for 240v ac operation!!!!

All prices include Sales Tax. Freight and Insurance extra.
Prices and specifications are subject to change without notice

EMOTATOR

103LBX, Medium Duty.....\$169.
502CXX, Heavy Duty.....\$249.
1102MXX, Extra Heavy Duty.....\$369.
1103MXX, Extra Extra Heavy Duty.....\$395.
502 Mast Clamp.....\$32.
103 Mast Clamp.....\$22.
VCTF-7, 7 Core Cable, per Metre.....\$1.20.
VCTF-6, 6 Core Cable, per Metre.....\$1.00.

Sideband Electronics Sales



KENWOOD

TRIO KENWOOD COMMUNICATION CENTRE

Trio-Kenwood Amateur Equipment
Trio-Kenwood Test Instruments
B & K Precision Test Instruments.



KENWOOD PRODUCTS:

TS-120-V All solid state transceiver 30 W.P.E.P.
TS-520-S 160-10M Transceiver
TS-820-S 160-10 M. Transceiver
R-820-S 160-M. Transceiver
R-820 Communications receiver
TS-700-SP. All mode 2M. transceiver.
TS-600-A All mode transceiver
TS-7000-A 2 M FM. 25W. Transceiver
TR-7500 2.M. FM. 10.W transceiver
TR-7600 2.M. FM digital transceiver 800 CH.
TR-8300 70. CM. FM Transceiver
VB-2200-A. Power booster for TR-2200
VFO-30-G Remote VFO for TR-7200 TX-12. MHZ-RX. 45. MHZ.

OPTIONAL ACCESSORIES

VFO-120
PS-20
MB-100
YK-88C
SP-120

KENWOOD PRODUCTS

TR-7200-G 2.M. FM 10.W Transceiver
TR-7010 2.M. SSB 10.W. PEP Transceiver
TV-502 2.M. Transverter
TV-506 6.M. Transverter
TL-922 2 KW. PEP. Lineal amplifier
SP-8 Regulated Power supply 8.Amps
VFO. 520-S External VFO for 520-S
VFO. 820 - External VFO for 820-S
VFO. 700-S External VFO for TS-700-SP
SM-220 Station monitor
BS-8 and BS-5 PAN adaptor
SP-820 Deluxe Speaker consul
SP-520 Speaker consul
SP-70 Speaker consul for TS-700 & 600
VOX-3 Vox unit for TS-700 & TS-600
DS-1-A DC converter for 520-S & 820-S
DG-5 External digital display TS-520-S
AT-200 Antenna coupler
MC-30-S Microphone 500 OHM
MC-35-S Microphone 50. K. OHM
MC-10 Microphone 50. K. OHM.
MC-50 Deluxe desk Microphone dual imp
HC-2 Deluxe Ham clock
YG-68 CW. filter for TS-820
YC-3395 CW filter for TS-520
LA-30-A Lowpass filter
HS-5 Headphone
HS-4 Headphone
RD-15 Dummy load 450 MHZ. 15. Watts
RD-300 Dummy load 150 MHZ. 300 Watts.

HY-GAIN ANTENNAS

12-AVQ 10-15-20M vertical 13 1/2" tall..... \$50
18-AVT/WB 10-80M vertical 23" tall..... \$125
TH6-DXK 10-15-20M senior 6 el. yagi 24' boom..... \$300
TH3-MK3 10-15-20M senior 3 el. yagi 14' boom..... \$240
TH3-JR 10-15-20M junior 3 el. yagi 12' boom..... \$175
204-BA 20M 4 el. Tiger Array 26' boom..... \$230
HY-QUAD 10-15-20M full size cubical quad..... \$260
2M 5 el. Yagi w/balun 6'3" boom..... \$25
2M 8 el. Yagi w/balun 12'5" boom..... \$30
2M 14 el. Yagi w/balun 15'6" boom..... \$40
BN-86 Balun 50 ohm 1:1..... \$20
BU-5 Balun 50 ohm 1:1..... \$14

ANTENNAS SUITABLE FOR 10M

11M 5 el. Yagi 17' boom..... \$70
11M 1/2 wave G.P. w/3 radials..... \$20
CLR 5/8 wave vert. w/4 radials 22'9 1/2" 11M..... \$50
CLR-2 5/8 wave vert. w/3 radials 19'10" 11M..... \$40

ROTATORS AND CABLE

KEN KR-400 rotator medium duty 28V-AC..... \$125
CDE HAM L11 rotator heavy duty..... \$175
RG-8U Polyfoam Coax..... 80c per yard
RG-58U Coax..... 30c per yard
8 core rotator cable..... 65c per yard

SKY-BAND MOBILE HELICAL ANTENNAS

SKY 80 six feet long 3.5 MHZ..... \$28
SKY 40 six feet long 7.060..... \$26
SKY 20 six feet long 14.150..... \$26
SKY 15 six feet long 21.100..... \$25
SKY 10 six feet long 28.500..... \$24

CRYSTAL FILTER, 9 MHz, similar to

FT-200 ones. With carrier crystals..... \$39

COAX CABLE CONNECTORS

PL-259
SO-239 Chassi Mount
Male to male joiner
Female to female joiner
Angle connector

Accessories

SWR 50A 3.5 - 150Mhz SWR meter..... \$26
12VDC regulated supply..... \$26
5M RG 58-U w/PL-259 one end..... \$3
Bumper mount c/w/3/8" 24-thread ant. mount..... \$7
Gutter mount c/w/3/8" 24-thread ant. mount..... \$4.50

**SIDE BAND ELECTRONICS SALES, 477-479 PACIFIC HIGHWAY,
CROWS NEST. PHONE 438 4191.**

KENWOOD AMATEUR RADIO EQUIPMENT

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PETER SCHULZ, VK2ZXL

YAESU AMATEUR EQUIPMENT



- | | | | | | |
|---|----------|---|----|---------|-------------------------------|
| 1 | SP-901 | Extension Speaker for FT-901 | 10 | YD-844A | Base Microphone |
| 2 | FT-901DM | All HF Band Transceiver with Everything!! | 11 | YP-150 | Dummy Load |
| 3 | FV-901DM | VFO with Scanner & memory for FT-901DM | 12 | SP-101 | Extension Speaker for FT-101E |
| 4 | FC-901 | Antenna tuner for FT-901 | 13 | FT-101E | HF Transceiver |
| 5 | FRG-7000 | Full band HF Receiver with Digital Clock | 14 | YC-601B | Digital Counter for FT-101E |
| 6 | FP-301 | 25 amp 13.5V Power Supply with Speaker | 15 | YC-500S | Frequency Counter |
| 7 | FT-301 | All HF Band Transceiver | 16 | FT-227 | 2 metre FM Transceiver |
| 8 | FT-301D | All HF Band Transceiver | 17 | FT-7 | HF mobile Novice Transceiver |
| 9 | FP-301D | 25 amp 13.5V deluxe Power Supply with Digital Clock, Speaker & I. D. facility | 18 | QTR-24 | World Clock |
| | | | 19 | YD-846 | Mobile Microphone |



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Everything you need for a first class station and all matched in
quality and looks. Now, take a look below.

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LEADER —



FT-901 DM De-luxe SSB, CW, AM, FSK, FM, HF Transceiver 160-10m, P.A. 2 x 6146B, Dig. readout, freq-memory, elect. keyer, rejection tuning, variable IF, audio peak filter, automatic tune-up timer, AC-DC operation etc., etc. Write to Bail for new colour leaflet on 901DM series.

SP-901 Speaker

Dress up your station with the addition of the SP-901 external speaker. High quality speaker unit housed in an attractive cabinet to match the 901 styling.



FTV-901 . . . VHF/UHF OSCAR Transverter.

A three-band VHF/UHF transverter from Yaesu for your FT-901 DM station. Basic unit is equipped with 144 MHz capability and option for 50 and 430 MHz plug-in modules. Repeater offset for 6 and 2 meters and full duplex operation on OSCAR modes A/B/J with external receiver.



FV-901DM Synthesized, Scanning External VFO

Flexibility in frequency control, PLL synthesis in 100 Hz steps; auto scan mode, which will search the band for a signal; manual mode which scan at one of three rates while you activate lever switch. Memory bank for up to 40 frequencies and clarifier for fine tuning between the 100 Hz steps, etc.



FC-901 Antenna Coupler

Efficient, compact antenna tuner for FT-901DM series. Features in-line wattmeter, SWR meter, and provision for selection of three coax-fed antennas and one single wire antenna. Presents a 50 ohm load to your FT-901 DM, all across the band.



SP-901P Phone Patch/Speaker

Integrate your FT-901DM station with the SP-901P combination hybrid phone patch/speaker. Styling, size and interconnections match the FT-901 series of transceivers.



YO-901 Multiscope

High-performance oscilloscope, two-tone generator and an optional band scope (panadaptor) for instant determination of band conditions and activity. Monitors both received and transmitted signals. Convenient interconnecting jacks for 901 series.

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Ph. 624 2691
Ph. 69 2040
Ph. 21 2125
Ph. 57 8630
Ph. 221 1272
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1978 REMEMBRANCE DAY CONTEST RESULTS

WINNER - VK1 DIVISION

	a.	b.	c.	d.	VK2 OPEN										ZIG	64	4	37	NV	21
VK1	204	1556	25047	129237	BO	2073	SW	197	AJQ	47					NBZ	52	4	37	NV	21
VK7	321	1581	34121	107877	OO	1283	CU	191	NAW	34					BNZ	51	35	EH	20	
VK6	706	2641	58265	65169	RTZ	1253	ADR	152	ZVN	23					XB	69	32	ZSD	20	
VK5/B	1149	1819	69872	62630	NPS	1196	AHU	113							NHR	52	23	PR	19	
VK4	2054	59325	57446		AOA	1178	HZ	105							AF	47	23	ATJ	19	
VK3	2615	1566	48463	20099											ZRF	47	28	NIL	17	
VK2	3312	1498	44926	15063											3EF/	46	27	MU	16	

- a. Licences.
b. Average top 6 logs.
c. Total points from sections a, b and c.
d. Trophy score.

The following details show the section and the points scored:

VK1 PHONE										VK4 CW									
GB	2013	NBH	413	ZT	142	ADW	1402	AAW	383	BFN	111	BQ	39	ZJP	27	NS	9		
PIU	1768	KV	401	ZCB	121	ANA	1309	NMW	367	ARS	108	IE	39	IO	24				
RK	1082	US	384	NBI	107	AQZ	1280	AEC	348	AOM	101	3CX/		ZFA	22				
BC	1074	PA	337	ZTX	106	NNX	1199	NBP	335	ZE	98								
TD	1018	QJ	309	DS	82	AFE	1119	ZJ	326	WY	94								
SB	949	BS	305	VW	79	BIR	1105	RU	324	VFZ	91								
GM	757	NAV	293	VP	69	BLF	1098	AGH	318	BIT	89								
BX	729	FT	289	OJ	66	ANM	1070	NAW	316	BIE	88								
RH	695	NBM	272	ZJ	55	DF	985	QH	303	LR	88								
DV	650	ZAR	235	ZAG	34	BHU	894	OD	299	RF	88								
NAT	621	NAO	196	TR	32	DS	882	SZ	290	BSR	83								
KP	513	EF	195	ANR	23	NLO	626	XY	281	ZAE/	83								
XU	480	YS	186	ML	12	BLV	813	BI	275	NED	91								
TH	454	JJ	184			NMI	791	BJM	256	NMX	80								
MF	448	WI	171			NLS	736	WJ	244	ZAO	78								

VK1 PHONE										VK4 OPEN									
GB	2013	NBH	413	ZT	142	ADW	1402	AAW	383	BFN	111	HE	1964	AAU/		AWR	253		
PIU	1768	KV	401	ZCB	121	ANA	1309	NMW	367	ARS	108	MS	1927	P	747	ZA	79		
RK	1082	US	384	NBI	107	AQZ	1280	AEC	348	AOM	101	RH	1413	WL	483	LZ	57		
BC	1074	PA	337	ZTX	106	NNX	1199	NBP	335	ZE	98	UX	1000	DT	394	FI	56		
TD	1018	QJ	309	DS	82	AFE	1119	ZJ	326	WY	94	GH	967	ATW	376	AK	55		
SB	949	BS	305	VW	79	BIR	1105	RU	324	VFZ	91	YG	821	SO	359				
GM	757	NAV	293	VP	69	BLF	1098	AGH	318	BIT	89								
BX	729	FT	289	OJ	66	ANM	1070	NAW	316	BIE	88								
RH	695	NBM	272	ZJ	55	DF	985	QH	303	LR	88								
DV	650	ZAR	235	ZAG	34	BHU	894	OD	299	RF	88								
NAT	621	NAO	196	TR	32	DS	882	SZ	290	BSR	83								
KP	513	EF	195	ANR	23	NLO	626	XY	281	ZAE/	83								
XU	480	YS	186	ML	12	BLV	813	BI	275	NED	91								
TH	454	JJ	184			NMI	791	BJM	256	NMX	80								
MF	448	WI	171			NLS	736	WJ	244	ZAO	78								

VK1 CW										VK5 PHONE									
PG	1366	DH	530			ADW	1402	AAW	383	BFN	111	QX	2163	ZBI	302	ZSD	111		
						ANA	1309	NMW	367	ARS	108	CHL	1971	NIC	293	RK	103		
						AQZ	1280	AEC	348	AOM	101	MG	1773	OC	291	NBG	105		
						NNX	1199	NBP	335	ZE	98	ML	1529	WR	289	FJ	96		
						AFE	1119	ZJ	326	WY	94	LP	1219	LM	282	NX	96		
						BIR	1105	RU	324	VFZ	91	NX	1208	EF	281	ZHS	94		
						BLF	1098	AGH	318	BIT	89	ZH	1159	ZAY	278	VB	90		
						ANM	1070	NAW	316	BIE	88	ZZ	1066	OL	274	CL	87		
						DF	985	QH	303	LR	88	OU	1021	WIE	272	ZCM	86		
						BHU	894	OD	299	RF	88	NN	995	ZK	263	JX	84		
						DS	882	SZ	290	BSR	83	ZGO	940	ZMO	254	JT	82		
						NLO	626	XY	281	ZAE/	83	LN	861	NVM	246	ZO	82		
						BLV	813	BI	275	NED	91	55	55	55	245	NDB	80		
						NMI	791	BJM	256	NMX	80	61	61	61	239	YX	78		
						NLS	736	WJ	244	ZAO	78	NJ	849	NDS	215	NJ	78		
						AYF	609	AIE	239	BMV	76	AMJ	753	ACE	206	HN	75		
						NJE	676	NAF	219	YLD	76	KR	740	RI	206	YV	73		
						YMO	638	AMK	218	AVQ	74	NQJ	737	ZF	203	NPP	66		
						XF	604	BGM	212	JJ	73	FO	715	ZSF	203	SN	66		
						SM	570	ZYL	203	OK	59	DI	702	OZ	203	NCC	63		
						LP	564	NOV	150	BJW	56	TY	675	VV	194	ZB	63		
						BBM	540	JV	183	RN	51	BW	644	WW	189	KG	62		
						YQ	511	BIS	182	AAI	42	GL	596	CY	188	AS	60		
						NDF	493	ZUX	173	ACS	39	ATW	580	ASA	187	HU	58		
						NB	469	NNU	154	BER	36	ABW	572	ZLH	184	CA	57		
						AER	459	BCC	151	ZXW	34	ZJB	555	ZIM	182	IM	57		
						HE	465	ZR	141	ZNQ	22	US	545	OT	176	IM	57		
						RG	429	YIW	137	BME	21	BP	530	ZRS	176	NF	56		
						JV	424	NFQ	131	BDE	15	LQ	529	BG	173	ZAJ	51		
						KK	389	NRB	121	ATN	6	TD	526	NIS	173	WN	50		

VK1 OPEN										VK3 CW									
AOP	1552	RC	1153	NAS	505	AEW	774	AJB	398	PG	55	FC	748	AMD	396	ACV	55		
DA	1482	JN	1034	AVM	89	DG	624	ANI	320	AT	46	AN	624	ANI	320	AT	46		
						RJ	574	MR	209	FAL	38	KF	518	SV	184	OF	22		
						YK	474	NK	164	OF	22	AM	753	ACE	206	HN	75		
						BDH	470	YL	84			KR	740	RI	206	YV	73		

VK2 PHONE						VK3 OPEN													
						AEW	774	AJB	358	RG	55	ZGU	804	ZMU	254	JT	82		
						GF	748	AMM	395	ACV	55	LN	861	NVM	245	ZQ	82		
						DG	624	ANI	320	AT	46	XZ	856	VE	245	NDB	80		
ARX	1794	NMG	295	HJ	105	KJ	574	MR	209	FAL	38	NJ	849	NDS	239	YX	78		
BGI	1284	AIC	289	NWE	102	RF	518	SV	184	AYA	28	BI	775	NRM	215	NJI	76		
ADZ	1276	CJ	298	BJT	100	YK	474	NK	164	OL	22	AMJ	753	ACE	206	HN	75		
BAX	1164	ZBV	272	ZIA	100	BDH	470	YL	84			CR	740	RI	206	VT	73		
BDN	1135	AUX	267	NJN	100							NMJ	737	ZF	203	NPP	66		
BAM	1128	XT	227	NWL	89							FO	715	ZSF	203	SN	66		
BGL	1011	QC	223	BDT	88							DI	702	OZ	203	NCC	63		
AGF	935	AKQ	214	NYZ	82	UM	2291	HY	407	AZT	205	BY	675	VV	194	ZB	63		
BFR	809	AGZ	196	LE	80	WP	1758	VF	387	ALS	201	TW	644	VW	189	KG	62		
BIP	795	NFT	185	NJK	78	WW	1384	PR	330	KY	101	GL	595	VC	188	AS	60		
BUC	747	ZCI	185	NFG	74	YF	636	XB	315	NKY	83	ATW	580	ASA	187	HU	58		
BFG	678	NRB	180	ADL	71	OP	580	NIL	288			ABW	572	ZLH	184	CA	57		
BSB	652	NHD	180	WD	70	LV	410	DQ	219			ZUB	555	ZIM	182	IE	57		
NUO	640	BND	177	AZO	65	FC	748	AMM	395			USJ	545	OT	176	IM	57		
AUX	625	NAM	175	CO	60														

VKS CW

8HA	1528	HO	416	ABB	116
UM	1410	DL	322	QR	82
OR	1222	KU	322	UE	68
BN	816	LI	316	KY	62
FY	566	RT	150	NKA	52
AU	482	QQ	127	AI	17

VKS OPEN

EN	1816	NTB	566	RK	270
KK	1607	QI	552	AVQ	281
8NT	1583	8DB	396	JK	127
BO	1510	NMQ	390	TL	37
MY	1123	8NJJ	370		
ALC	584	IP	343		

VKS PHONE

AS	3589	LV	392	SH	131
WV	2843	CD	374	NCW	130
HK	2566	ZBJ		TU	127
OR	2254	NBJ	364	ZGA	124
DA	2081	FS	361	KD	121
NBU	1994	FM	304	ZJX	116
AO	1757	ZDT		JK	112
JP	1732	NCT	303	NER	90
ST	1536	NCR	296	MM	83
LD	1293	ZYM	254	VW	74
LY	1241	NAR	246	IC	71
SU	1162	ZIT	230	ZKI	68
JX	1028	HU	227	MB	67
NAY	958	LG	221	EJ	
IF	954	TP		P	45
9XW	857	P	217	MO	40
RL	720	TR	185	EB	39
NDG	663	ZBD	176	NEB	37
NAN	646	BV	164	IH	31
XD	573	GB	163	ZGZ	26
WL	486	ZGO	152	ML	19
NCY	455	ZPB	147	NDL	18
TX	445	NQO	145	JO	8
AO	444	NQ	140	ZKL	7
DC	417	OO	139	SO	5

VKS OPEN

ED	2512	LP	632	ZKY	
RU	1896	NAG	632	NAM	194
PD	1374	FC	532	GL	107
NAO	970	HE	384	MG	52
GW	746	CR	285		

VKS CW

WT	1874	RM	676	HX	275
HQ	1756	AJ	668	SM	222
AO	1226	MA	388	NK	212
RS	770	VK	356		

VKT PHONE

AE	2042	WIP	388	KK	144
KZ	1688	BM	362	NXJ	107
HK	1553	CT	375	LS	102
MS	1487	NTS	359	ZBL	102
KH	1274	CL	342	ZJB	93
KC	1154	BJ	297	IL	84
MX	1041	FT	290	TT	76
GD	842	JR	285	ZAH	64
GW	834	EB	264	ZTA	62
HL	802	AI	261	JD	34
JV	668	NFR	251	ZAK	34
SS	650	NAD	250	NAM	32
NCW	626	AX	233	KS	30
AW	622	NRM	218	NWS	30
IC	595	NSA	192	JG	23
SG	552	LH	178	ZAJ	18
NOW	511	SS	175	ZDC	18
NOP	510	ZLB	178	ZRF	17
SF	470	MG	166	ZBY	15
PF	434	CF	155	JN	12
NAE	424	ZOA			
PK	414	NOA	155		
GS	410	ZFP	147		

VKT CW

CH	1364	NZ	356	MC	198
RO	1162	RD	322	ZO	96
TW	840	GV	270		

VKT OPEN

CCC	1022	AC	277	NGD	199
ZZ	520	ZIE	271	ZAT	198
AL	488	ZPB	231		

RECEIVING

Bryan Gard	L1003	3478
Ron Whitford	S. Aust.	2363
Graham Mutton	L70107	1992
Gregory Cooke	Vic.	1769
F. H. Price	L60030	1707
June Greenaway	W. Aust.	1662
John Brereton	L50257	1593
David Pedler	L30740	1107
L. J. Harper	L70151	1104
Eric Trebilcock	L30042	824
Stephen Pall	L20301	758
John O'Brien	N.S.W.	723
Mark Stephenson	L30848	668
H. J. Charles	L70126	631
M. Davidson	Qld.	608
Robert Chester	L50087	476
George Edmeades	L30122	345
George Clark	L60336	316
Robert Hodges	L40724	233
Daryl Boyce	L20658	140
Tim Hamilton	L60296	107
S. E. Maddigan	Tas.	45
David Warrington	S. Aust.	35

OVERSEAS CHECK LOGS

P29LS	Ph	3432	ZL2GJ	P	1279
ZL1GQ	O	2578	P29JA	P	328
ZL1AFE	O	1972	ZL4IJ	P	311
ZL4BE	O	1754	ZL1AGO	P	311
ZL4HA	CW	1664	ZL1TB	P	283
ZL3SZ	P	1433	ZL1TX	P	199
P29NKV	P	1395	ZL1HV	CW	—
P29EJ	O	1305			

COMMENTS FROM CONTEST MANAGER

The general standard of log presentation was shocking. A large number of logs did NOT have a cover sheet giving the details required in the rules, others were not scored and in one case no call-sign or name appeared. Every size, shape and quality of paper was used and one log was even held together by solder! The worst Division for errors was VK1, over 50 per cent of the logs were totalled wrongly making hundreds of points of difference.

These matters make the job of the contest manager more difficult and this being my first one has stunned me somewhat. Consideration must seriously be given in the future to disqualify without question any logs that do not meet the simple instructions laid down in each contest for presentation.

So much for the brickbats — now for some bouquets: Eric Trebilcock, Receiving Section CW only..

The following Novices for excellent scores:

VK1NT	821	VK2NPS	1196
VK3NNX	1199	VKANEX	700
VK5NTB	566	VK5NBU	1994
VK7NCW	626		

Alan VK2BAX and Pierce VK2APQ for the best presented logs.

QSP

VHF & HF CROSS PATCHING

The Postal and Telecommunications Department has advised that they are concerned with the cross-patching of Amateur stations from VHF to HF and vice-versa. This system is employed regularly by some clubs during their club nets. The Department has stressed that it is contrary to the regulations for a Novice's transmission to be relayed to any band which Novices are not permitted to use, and similarly, Limited calls must not be relayed to any band which they are not permitted to use ordinarily.

Members of the Department have apparently observed through-patching of Novices to VHF and Limiteds to HF without even the appropriate identifications being announced.

From VK2 Mini Bulletin, Dec. '78.

Visiting Hong Kong

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- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

TH6DX Hygain, as new, complete with BN86 balun and 36 ft. heavy duty galv. mast, crated on transport, \$275. Denton antenna tuner MT-2000A, \$210. Osbornelock SWR200C, \$50. Both new, in cartons. Katsumi EKR elec. keyer, 12V-240V AC, good cond., \$50. J. Moyle VK4ZT, QTHR.

Yaesu F67R Tcr in mint condition, \$380. VK2BVI, QTHR. Ph. (02) 8432 (bus.) or (02) 449 2198 (AH).
Heathkit HW101 80 thru 10, excellent performer, heavy duty power supply, mint, spkr., \$350. VK3SFA, QTHR. Ph. (03) 548 4947.

Complete Drake Station, mint condition, T4XC Tcr, 200W PEP and RMC R4 (160-10M), \$899. AC4 power supply, \$85. M54 speaker \$25. Extra xtra for almost entire 0-30 MHz band, all AC connecting cables, all ONO. Will trade FT101 or similar for mobile work, particularly VK5TO, QTHR. Ph. (08) 278 3128 AH, or (08) 381 1423 bus.

Sideband SE502 Transceiver, 240V AC 12V DC, 24 ch., 28.3/28.6 MHz, clarifier R4xT5, SWR/RF meter, 3 l. 10 m yagi, plus 50 ft. co-ax, \$205. Bruce Hood VK5NBA, Bolognaw, via Naracorte, 5271, Ph. (087) 64 7545.

Icom IC202 2m SSB/CW Transceiver, Oscar crystal plus 12W linear, complete with coax leads, \$175. Full set of Hustler antennas, complete with base and spring, 110m. VK2LH, QTHR. Ph. (05) 456 2027.

Yaesu FL-200B Tcr and FR100B Tcr, spare set new final tubes, speaker, manuals, connecting cables and mike, \$350. Swan Tcr, 80-40-20m, AC and 12V DC power supplies, \$105. Yaesu 6m converter FC6, 20. Herb VK4KM, QTHR. Ph. 55K Mumburba.

Bargains in mint condition, complete with original cartons and manuals. Drake TR-4 with spare new finals, all stals, RV4C remote VFO, 34PNB noise blander, AC4 power supply, Yaesu FRG7 receiver, KW107 Super Match, Mosley TA33 Senior tri-band beam, Drake TV3300 low pass filter, Shure 201 mike, mike mixer pre-amp, Mini SWR meter. Best offers. Please call VK2ASH, QTHR.

Communication R4, Realistic SX190, covers ham and internet. BC bands in eleven 500 kHz segments, with service manual and speaker, new cond., \$180. VK1ZUM, Ph. (062) 49 1595 AH.

Multi-Band Vertical Antenna by Hidaka, 80, 40, 20, 15, 10m, complete with nylon guy ropes, as new condition, 12 months old, \$100. 10m mobile transceiver, 1 m. band, Genietronics GTX325, 28.3-28.5 MHz power supply also available if desired, \$100. VK4NGK, 28 Coolmunda St., Mansfield, 4122.

"Belcom" SSB Tcr, covers 28.348-28.638 MHz, also fitted for CW, 50. Brian VK2BVI, Ph. (02) 525 2547.

Yaesu FT 75-B 100m-10m Tcr, AC and DC power supplies, external VFO, mobile mounting bracket, and for all bands. AH, as new condition, \$450 with full complement of all repeaters with 20 Hz to 30 MHz digital frequency counter, \$95. P. King VK2NRZ, Ph. (049) 73 1120 AH, (049) 77 1103 bus.

Collins KWM-2 Tcr with Collins PM2 plug-in power supply, first class order, with instructions, mic, dummy load, SWR meter, etc., complete station, \$1450. Ken KP202 2m FM Tcr in "as new cond.", with full complement of all repeaters with 40/50/100 nickel-cad. batteries and 240V charging base, \$155. VK3AHR, QTHR. Ph. (03) 836 4203.

National NCX-3 Xcwr, 240V PSU/SPKR, Turner 90D-S Mike, \$250; Drake SSR-1 AC as new, \$250; Eddystone 770R VHF R4, \$195; Heathkit IM-18 TTYM, 240V, \$35; Advance HA-1 Audio Sig. Gen., \$50; 301 SWR Meter, 11.5 all items with 10m yagi, Chas VK31B, 75 Lloyd St., Dimplo, 3414. Ph. 76.

FT101 and Osbornelock SWR Bridge, 5600 the lot. VK3ADB, QTHR. Ph. (051) 34 2718.

Swan 700 CX SS-16B-Special 700W PEP SSB Transceiver, complete with AC supply and special 16 pole filter and spare finals, mint condition, \$850. VK3WV, QTHR.

Hygain trapped Vertical Antenna, type 14AVO for 10, 15, 20 and 40m, good condition and instruction manual included, \$75. VK2AXR, QTHR. Ph. (02) 44 1389.

200 MHz Frequency Counter, basically EA design, fully built and calibrated, features 0.6" LED reads out, selectable 7 digit/2 second update or 8 digit/continuous update, ceramic range switch, BNC input, 240V AC/12V DC operation, lives in a grey enamelled box 220 x 230 x 70 mm, \$90 ONO. Will consider swap with/without cash adjustment for other gear. FT101 series mobile mount, \$20 ONO. Mike Vale VK1VW. Ph. (062) 88 8994 AH, (062) 83 2215 bus.

Mouse Tapes — All Speeds — the cheapest and the best. CD0 specially speed when ordering, \$2 posted. WIA VK2 Education Service, PO Box 109, Teongaballa 2146.

Yaesu FLDX/FRDX 400 Matched Tx/Rx with ext. speaker, manuals and original packaging, 10-80m, 240W PEP split frequency capability, AM, SSB, CW, 2 selectable filters, FSK obtainable by making minor modification, mint condition, \$650. VK2NOK, (02) 827 3559 after 6000 hrs GMT.

"Amateur Radio", Oct. 1971 to Dec. 1976, complete except Aug. and Dec. 1975 and Nov. 1976. Also "New Scientist" 29 July 1976 to 29 Dec. 1977. Best offers plus postage accepted. VK3G1, Box 22, Woodend, Vic. 3442, or Ph. (054) 27 2578.

Yaesu FT DX 400 with adjustable effective noise blander, speaker, cooling fan, second VFO, set of 19 spare valves, manual, \$500. TR-44 rotor and control unit, manual, \$90. MFJ (US) audio speech processor, manual, \$25. All equipment clean, unmarked and in original working order (owner paid \$50). VK2AOU, Ph. (02) 53 9789 AH, (02) 807 0454 bus.

Yaesu FT620B Transceiver with VC-75 voice controller and handbook, as new, 20W SSB, CW; 8W AM; AC/DC, all solid state auto final protection, \$515. VK2ZMA, Ph. (02) 634 2451.

Eddystone Model EC10 solid state communications Rx, 55 to 30 MHz, excellent condition, \$160. Ross Treloar VK2BP2, QTHR. Ph. (02) 239 5267.

Linear using pair of 3.5002 in parallel, built to Heathkit SB 200 circuit, power supply, separate range of some 2000-5000V. All parts imported from US, 2 only new 3-5002 as spare parts. Power supply 20-30-40V each side CT — 10 mA with 6/40 rectifiers, electro condensers and 3055 to make two 10A — 12V supplies, voltmeter included. Offers requested for both. H. G. Wilson VK4GO, QTHR. Ph. (071) 27 4101.

Tower, Hills 57' triangular steel winch-up, CW base work guy wires, turnbuckles, etc. \$220; also Standard 6 ft. rack, 320. VK2VD, QTHR. Ph. (02) 371 6735.

Realistic DX160 R, perfect condition, \$100. VK2FNI, QTHR. Ph. (042) 54 6170 AH.

TS520, unmarked, 18 months old, AC/DC, \$520, or may haggle a little. VK2AZT, Ph. (069) 42 1392.

Swan 350, matching AC, PS, USB, LSB, alt. calibrator, VOX unit, microphone, manual and unused spare valve and relays, \$350. VK2YN, QTHR.

Yaesu FTDX500 Tcr (similar to FTDX401), 560W PEP 80-10m, with noise blander necessary. All in A1 condition (some spare valves included, \$500). Eddystone Amateur band only R4 88BA (double conversion), some spare valves, \$200 ONO. VK2UE, QTHR. Ph. (02) 451 3032.

Yaesu FT101 R, including both 6-2m converters, all modes 150-2m. Yaesu FT101 Tcr, 160-10m, both units as new condition, in original cartons with instruction manuals, \$1300. VK6ET, QTHR. Ph. (092) 276 8928.

Audio Magnetics recording tape, 1500 ft. on 7 in. reels, in boxes. No drop-outs, high sensitivity. Performs identically to Scotch and Ampex pro. stock with small bias adjustment. Specifications available, incl. typical noise, frequency response and distortion figures. \$5.00 each or \$4.50 for 10 or more. Surplus to own note. VK3BNB, Ph. (03) 523 9229.

C60 Cassettes Hi-Fi LN Screened Case, \$65 per 100 inc. freight. Smaller lots sim. rate, Army HF C11R210 TRNSC inc. PS ATU cables and manuals, \$120. HF REC, 7/15 MHz EC DCA, \$30. EA Dellateth complete kit, \$150. Phone Barrie VK3YMW (058) 21 9458.

Yaesu FRG-7, 0.5 to 30 MHz continuous coverage Rx. Largest model with fine tuning, as new condition, plus professionally built 2m mosfet converter, would be, but no mouse invoice, \$320 ONO. Ph. (03) 51 4041.

Drake T4X-R4 combination with power supplies, instruction manual and connecting cords, in excellent condition, \$750, or sell separate. Galaxy "Rejecto" audio filter and amplifier with 12 volt P/S, \$50. Quasi-noise blander N84 for R4C Rx, new, \$45. Drake-logarithmic speech processor, as new, \$45. MFJ SSB selectivity filter, \$20. VK3LC, QTHR. Ph. (03) 509 5556.

Complete Drake Line Station, comprising TR4 Tcr, \$575; remote VFO RV4C, \$125; external speaker BMSA, \$42; ant. matching unit MM4, \$15; watt-meter W4, \$49; cables and mike included. All mint cond., looking for buyer in Sydney metrop. area who will take complete station. Offers invited. VK2AOV, QTHR. Ph. (02) 449 3538.

Complete Yaesu Line Station, comprising FT101 Tcr with VK5 mods, fan, 10-160m, \$550; FL2000 linear, \$385; remote VFO VF101, \$105; external spkr. box SP101, \$32; cables and mike included. All mint cond. Looking for buyer in Sydney metrop. area who will take complete station. Offers invited. VK2AOV, QTHR. Ph. (02) 449 3538.

Bits and pieces from deceased estate. Telequipment service scope, \$50; advance sig. gen., \$40; Varian C-280V RA, \$90; Heathkit 5B510 monitor \$40; Heath Heath Cantenna HN21 1kW, \$25; Swan-tenna model 45, 10-80m mobile ant. with base, \$105; set of 5 Hustler mobile whips, 10-80m, \$70; 2m base loaded 5' steel whip with base, \$15; Q-craft SWR/PWR bridge, \$20; Omega TE-701 antenna noise bridge, \$32. VK2AOV, QTHR. Ph. (02) 449 3538.

Icom IC202 2m SSB with "Oscar" crystal, \$150 ONO. Phil VK2BYX ex VK2VYQ, QTHR. Ph. (067) 52 1185.

Like new FT101E, with Kenwood LF30A LP filter and Midland 23-136 P/SWR meter, connectors, little use, \$735. VK4PJ, QTHR. Ph. (07) 399 2881.

TS520 AC/DC mode CW filter, in as new condition, \$650. VK3PR, QTHR. Ph. (056) 62 2711.

Complete RTTY station, in mint condition, as new. Includes Model 15 page printer, Model 14 tape reprocessor and tape distributor, all super sound proofed. Custom RTTY terminal DT600 Mk 2, loop supply 110V power supply switch cover, connectors and spare paper. Any inspection and trial, \$550 — will consider exchange HF gear, contact VK2BAX, Orange, N.S.W. Ph. (063) 62 7210.

FT7 Tcr, as new, \$500 ONO. VK3NOW, Ph. (053) 59 0248, or VK3NMJ, Ph. (053) 50 4203.

Heathkit HR10 R4C, covers 80-10m, built-in 100 kHz xtal cal., excellent cond., \$80 ONO. Teleprinter Cread 7B, complete with sound cover, good condition, \$40 ONO. Contact D. Hides 160412, QTHR. Ph. (09) 275 2698.

Yaesu FT101, good condition, \$550 ONO. Write J. Lee, Rywung, Qld. 4352. Ph. Rywung 3 U.

Hygain 18V 10m thru 80m base loaded vertical antenna, excellent portable antenna, \$35. Morrie VK3BCC, Ph. (03) 561 1151.

Yaesu FT75B8 and DC75B8 power supply, two channels fitted, 80, 15 and 10m, seldom used, in original cartons, \$75. VK6NAH, QTHR. Ph. (09) 446 3068.

Honda portable generator EM300, had little use, 1500 W, 3000 and 12V charging, \$325. Peter VK3NRP, Ph. (056) 55 1057.

Communications R4 Tandy SX190, covers 3.5 to 27.5 MHz, in excellent condition, must sell, \$180 ONO. D. Hughes L30853, QTHR. Ph. (053) 31 1138.

Dentron Tuner Jr. Monitor, ideal for mobile, as new, \$95 ONO. Geloso 222R Tcr, good order, \$100 ONO. AWA Class C wavemeter, \$15. VK3AKB, QTHR. Ph. (058) 44 3241.

Icom 22A in new condition, little used, channels 2, 4, 6, 8, 40, complete, as new, \$200. VK3QZ, QTHR. (051) 74 1797.

SBEM 80/15m Solid State SSB Tcr, 125 watts, inbuilt AC/12 volt DC power supply, complete and excellent order, \$350. Icom IC21A 2m FM base or mobile Tcr, \$175. Swan WM1500 in-line watt meter, 5/50/500/1500 watts, \$55. VK3OM, QTHR. Ph. (03) 560 9215.

20 Mz Mono Band Yagi Hign 2048A, 4 elements with BN86 balun, exc. cond., \$140. VK3UJ, QTHR. Ph. (03) 90 6424.

FRG7 Comm. Rx, mint condition, \$275. VK3AOC, QTHR. Ph. (03) 88 2180.

Set of mobile antennas for 80m, 40m, & 20m (Hy-Gain), complete with fold-over mast, spring, swivel base, heavy duty bumper mount and instructions. Very good condition, \$125. VK3AMK, QTHR. Ph. (03) 787 5561.

Two AVT Vertical Antennae, complete and in fair condition, \$50. ONO. VK2GK, QTHR. Ph. (02) 623 8292.

WANTED

Geloso T/R G222, handbook or circuit required urgently please. Loan or purchase. VK4LN, QTHR. Ph. (071) 82 2675.

Has anyone a Geloso G209R Rx in reasonable condition, they are willing to sell? Contact VK4LN, 43 Garrick Street, Gympie. Ph. (071) 82 2675.

Aspiring Novice Candidates — the complete self contained Novice study kit — contains material for theory, tests, papers and 1000 typical exam questions. Real value for money, \$15 posted. WIA VK2 Education Service, PO Box 109, Toongabbie 2146.

Collins 800 Hz bandpass filter, type F455FA08 and/or 500 Hz bandpass filter type F455FA05, both to suit 7553 receiver. VK2AS. Ph. (02) 467 1784.

Ammeter AC 0-20 amperes or more, in good condition. VK3AVH, QTHR. Ph. (059) 86 8797.

Swan 500/700 VOX unit, channel 3 xials to Ken KP202, price and particulars to T. Foster, 3 Sinclair Street, Beaufort. Ph. (053) 49 2028.

Taxi for novice bands, 230V, no objection to CB; antennas, preferably with SWR meter; grid dip oscillator; all items commercial or home brew, age no bar, but should be in working order and at reasonable price. John Weir, 100 Wrigley Street, Maroochydore, Qld. Ph. (071) 43 3023.

6LQ6 six new tubes required. Details to Bob McKernan VK4LG, 16 Tanderra St., Brackenridge, Qld. 4017. Ph. (07) 269 5175.

Private collector is interested in swapping old tapes of old time Australian, English, American etc. radio and TV programmes and advertising commercials. Movie posters, stills and 16mm and 35mm films (complete or segments) from commercial films also wanted. Will exchange air checks from Australian and overseas radio stations. VK2ATJ, Box 140, Kensington, N.S.W. 2033.

FV59 or similar VFO, suitable FT75B mobile, state condition and price, cheque forward. VK8TL, QTHR. Ph. (05) 368 7892.

Sideband attachment for IC245, will pay purchase price if in good working condition. Adrian Lewis VK3BYZ. Ph. (057) 93 7028 bus.

Plugs with under cables for No. 11 and 19 sets. 3BZ Rx. WWII Army type headphones. Pre-War movie keys and telegraphic gear, any type, condition. Write VK4SS, 35 Wynnot St., West End, Brisbane, Qld. 4101.

TS AVT 90-10m Vertical Antenna required. VK3BJO. Ph. (03) 729 2802.

TRADE HAMADS

Broadcast Band Listeners: "English Shortwave Stations Audible in Australia" publication is available exclusively from Southern Cross DX Club (Inc.), G.P.O. Box 336, Adelaide 5001 for 3 x 20c stamps. Over 40 countries listed!

Are you looking for a yagi, 10-11 or 15 metres, mono or duo bander, gamma match, spare parts or single elements for modular design also available. Please ring VK3NCW (03) 366 7042 after 5 p.m. Werner Wolf, 92 Leonard Ave., St. Albans 3021.

Alpha Linear HF Power Amplifiers, 1-30 MHz frequency coverage, 160-10 metres, Alpha 76 uses three EIMAC 8874 power amplifier tubes, Alpha 77 DX has single EIMAC 8877 ceramic triode, Alpha 77SX two 8877 tubes, the ultimate in high power linear, ideal for continuous duty RTTY, SSTV, contests, hard core DXing, reliable point to point worldwide communications distributor for Indonesia, Philippines, New Zealand, Thailand, James Goodger VK2JO, Australian Sound and Signal Research. Telephone (02) 369 0428 or (02) 369 7786; After Hours order number (02) 36 7756.

OBITUARY

LEN WORRALL

VK4WL

Len passed away suddenly, after an illness-free life, due to a heart attack, with only eighteen months of retirement.

Len obtained his licence at about 18 years of age in Sydney and was active in Cairns, with the late Doctor Hewitt on CW before World War 2, after which he remained inactive until 1973.

CW remained his great interest.

Len is survived by his wife Rose, a married son and a married daughter.

By Peter Brown VK4PJ

WILLIAM GEORGE CLARK

VK3FY

Bill passed away suddenly on 19th November 1978, after suffering a heart attack. Radio amateurs of the Bendigo area will greatly miss Bill, who was a valued friend of all. He was very active in WIA Midland Zone affairs, having been both President and Secretary.

Bill served in a Beaufighter Squadron in the RAAF in World War 2, and later at Foggall Signals Base. He obtained his licence post war, and since coming to Bendigo in 1952 had been active in many local activities. His hobby other than electronics, was a love of music. Bill was a church organist, and choral society member. He was a member of Legacy, and always helped local schools, scouts, in fact many, many people.

Bill's vocation was insurance, he was Assistant Manager of a large local office, and his ability and friendliness were well known.

He will be sadly missed by all of those who knew him, for he really was a fine man.

To his wife Daphne and his family, we extend our deepest sympathy.

N. Stilwell VK3ACN.

KEN MILLBOURN "SNOWY"

VK3CW

We all regret the passing of our good friend and amateur "Snowy". Let us convey to his wife and family, our deepest sympathy.

A word about our friend "Snowy".

Snow was an amateur of long standing, close to 30 years. He served with the RAAF during World War 2, with most of the time at Darwin.

Most Australian amateurs knew of "Snowy" via the little shop in Melville Street, Hawthorn. Here was a meeting place for amateurs and all those with a common radio interest, a cup of tea, a lot of natter, and a warm welcome.

Snow was a great supporter of the WIA, and for many years was Father Christmas at the children's treat. He was also a member of the Chelsea Life Saving Club, and performed the role of Father Christmas for the annual treat at Chelsea.

I feel "Snowy" was also Father Christmas to many amateurs, a kind, generous and honest man, a great feeling for his fellow man. I was proud to be his friend.

"Snowy" will be missed not only by amateurs but people in many walks of life.

Sadly for all of us.

Alan G. Smith VK3AN

NÖEL ARNOLD

VK2OJ

It is with deep regret that we record the passing of Noel Arnold VK2OJ, after a long and serious illness.

Noel had been licensed some fifty-one years, continuing active, except for a war break, until illness prevented him from operating.

He was most active on 20 metres CW — particularly with the United States.

He was one of the first amateurs in Albany district, from which he operated at all times, except for a few times mobile.

Noel was active in early radio club activities, furthering the interest of amateur radio by training younger aspirants.

He was a Life Member of the Quarter Century Wireless Association, New York.

To Noel's wife and family we extend our deepest sympathy.

Jack VK2AY

TED ISAACS

VK2ABO

It was with deep regret that I learned of the passing of Ted Isaacs VK2ABO.

I remember him for being honest and friendly, but above all for his generous nature. He would readily give assistance, regardless of any personal inconvenience.

Amateur Radio is the poorer for his loss, and the absence of "apples, bananas and oranges" will leave an empty spot on the dial — Vale Ted.

N. A. Laffman VK2APL

Mr. CLAUD BURNS

VKACB

Claud, who was born in Maryborough in 1893 had been an active amateur radio operator for over 54 years and in fact was active on the air up to within a few days of his death.

His first transmission was in 1924 from Rabaul, using morse code and his first amateur radio operator's licence was issued at Kingaroy in 1927 and his first call sign was ACB. This call sign was later changed to VK4ZY, the call sign which will now be so sadly missed on the air waves.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. W. G. CLARK

VK3FY

Mr. R. OHRBOM

VK3OC

Mr. C. MALONEY

VK3NDE

Mr. W. J. BRENER

VK3WZ

Mr. R. A. ISAAC

VK2ZAI

Mr. V. H. WILSON

VK2YW

Mr. N. ARNOLD

VK2OJ

Mr. R. SATCHEL

VK2BZS

Mr. M. J. O'BRIEN

VK2ZMO

Mr. A. H. TODD

VK4HT

Mr. L. A. WORRALL

VK4WL

Mr. C. E. J. BURNS

VK4ZY

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Sorry, we are not a massive bulk-buying supermarket! We cannot help you with screws, bolts and toilet seats! You can get them in a hardware shop! WE ARE SPECIALIZING ONLY IN HIGH QUALITY AND MOST SOPHISTICATED RADIO COMMUNICATION EQUIPMENT FOR AMATEUR AND PROFESSIONAL USE! We also don't challenge anybody, since we don't have a personality problem. We do not run down other dealers, as we believe in free enterprise. Nor do we run down their products — our products sell themselves! **All our products are brand new, top-quality, factory-tested, backed up by full warranty and after-sales service, by highly qualified technical staff. AND WHAT IS MOST IMPORTANT — OUR PRICES ARE THE CHEAPEST IN AUSTRALIA!** How much longer will you tolerate the incredible insult on your intelligence by those smooth, massive bulk-buying, rip-off operators? Just read their advertisement and compare the prices AND WATCH THEM SHUDDER WHEN YOU TELL THEM OUR PRICES!!

HF EQUIPMENT

NATIONAL	
RUX-820 Transceiver	\$1960
RUX-S1011 Speaker Unit	POA
RFXV1011 VFO Unit	POA
RJ4000/DR48 Receiver	\$466

YAESU	
FT101E Transceiver	\$899
FT301 Transceiver	\$890
FT301D Transceiver	\$1090
FP-301 AC Power Supply	\$175
FRG-7 Receiver	\$339
FTV-650 6 metre Transverter	\$249
FRG-7000 Receiver	\$639

ALDA	
Alda 103 HF Transceiver	\$495
Microphone	\$20
PS115 15A Power Supply	POA
PS120 30A Power Supply	POA

KENWOOD	
TS-520S HF Transceiver AC only	\$700
TS-520S 1F Digital Transceiver AC only	POA
SP-520 Matching Speaker for TS-520S	POA
SP-820 Matching Speaker for TS-820S, Incl. Filters	POA
VFO-820 Matching VFO for TS-820S	POA
VFO-520 Matching VFO for TS-520S	POA
SM-520 Monitor Scope Kenwood Series	POA
DS-5 Digital Display for TS-520S	POA
DS-1A DC Converter TS-820-820	POA
DS-8 Pan Adapter for TS-820S	POA
DS-9 Pan Adapter for TS-820S	POA
AT-200 Matching Antenna Tuner Power Meter	POA
Optional Crystal Filters	POA
MC-35S Hand Mike H2 Z	POA
MC-50 Base Mike H1 and LO Z	POA
TS-120 80-10m Mobile Digital Display 30W	POA
PEP	POA

DENTRON	
DTR-1 HF Transceiver	POA
MLA2500 Linear Amplifier	\$1790
CLIPPERQNL Linear Amplifier Jr. Monitor	\$1175
MT3000A Antenna Tuner	\$104
MT2000A Antenna Tuner	\$447
160/10AT Super Tuner	\$176
80/10AT Tuner	\$176
W-2 Wattmeter	\$95
Big Dummy Load	\$43
DTR-2000 Linear Amplifier	\$1360
Super Tuner-plus	\$206

WAWASEE PRODUCTS	
JB1002FC/M Counter/Wattmeter	\$225
JB1003C/M Clock/Wattmeter/SWR	\$135
JB1001SC/M Scope/Wattmeter/SWR/Counter	\$379
JB2000SW Wattmeter/SWR Bridge	\$75
JB1000S-M Scope/Wattmeter/SWR Bridge	\$310

ELECTROCOM	
"Series 400" Shift Converter	\$960

INFO-TECH	
MODEL 75 RTTY to Video Converter	\$448
MODEL 150 RTTY Keyboard	\$407
M-200E Morse, RTTY & ASC11 to Video Conv.	\$668
N-300 Morse, RTTY & ASC11 Keyboard	\$564

ROBOT	
Scan Converter	\$898
12 in. Video Monitor AVM-080	\$269
ASA 500 Video Camera	\$270

MIZUHO	
SX-58 RF Preamplifier	\$86
SX-1 Prescaler	\$63
DX-550 Counter Generator w/Prescaler	\$220
KX-1 Coupler	\$55
MX-10 Marker	\$59

OSKERBLOK	
SWR-300 Power Meter	\$111
SWR-200B Power Meter	\$84
Couplers 6m and 2m	\$39
Couplers 0.7m	\$39

HUNAR	
LF3-10012 Linear Amplifier	\$215
BI-LINEAR VHF Models	\$259
26-432 MHz Low Noise Preamplifier	\$42
OSCARBOX J UHF Down Converter	\$85
PAI-50B VHF In-line Preamp, Low Noise (5m)	\$54
PA-144B VHF In-line Preamp, Low Noise (2m)	\$54
PA-28, VHF In-line Preamp, Low Noise (10m)	\$54

B & W PRODUCTS	
MODEL 333 Dummy Load Wattmeter	\$122
MODEL 334 Dummy Load Wattmeter	\$121
MODEL 374 Dummy Load Wattmeter	\$265

COAXIAL ANTENNA SWITCHES (B & W)	
MODEL 371, 6 Positions	\$39
MODEL 595, 6 Positions	\$29.80
MODEL 550A, 5 Positions	\$33
MODEL 590A2, 2 Positions	\$27

ROTATORS	
Commander FU400 Rotator	\$117
Rotator Power Supply	\$22
Stay Bearings	\$36
6-core Rotator Cable	\$0.75/m
Master Clamps	\$11 (set x 2)
Coaxial Cable RG-8/U Low Loss	\$1.30/m

WILSON ANTENNAS	
SY-1 4-elem. on 20, 15 & 5-elem. on 10m	\$309
SY-2 3-elem. on 20, 15 & 10m	\$268

HUSTLER ANTENNAS	
4-BTV w/80m Resonator (10-80m Vertical)	\$135
(No GWT)	
RM-10 Mobile Resonator	\$19
RM-15 Resonator	\$19
RM-20 Resonator	\$19
QD-1 Quick-Disconnect	\$19
RS-2 Resonator Spring	\$9
RM-40 Resonator	\$22
RM-80 Resonator	\$22
MO-1 Bumper Mounting Mast	\$25
BM-1 Bumper Mount	\$17
BBT-144A 2m 3.4 dB Gain Trunk-Lip Mount Antenna	\$40
GG-144 2m 6.0 dB Gain Vertical Antenna	\$40
COT-144 2m 8.2 dB Gain Collinear Trunk-Lip Mount Antenna	\$76

OSKERBLOK	
SWR-300 Power Meter	\$111
SWR-200B Power Meter	\$84
Couplers 6m and 2m	\$30
Couplers 0.7m	\$39

ELECTRONIC KEYS	
EK121 Katsumi Keys	\$85
NYE VIKING Code Practice Set	\$29.90
NYE VIKING Standard Key w/Naval Key	\$16.50
HAMKEY HK1 Dual-lever Squeeze Paddle	\$43
HAMKEY HK3 Deluxe Straight Key	\$25
TRAC CMOS Electronic Key	\$49.50
TRAC Twin Paddle Squeeze Key	\$36

FREQUENCY COUNTER	
NACL Type BC275	\$99.50

MICROPHONES	
SHORE 444	\$55
KENWOOD MC 50	\$45
KENWOOD MC 35	\$25
KENWOOD MC 10	\$20

BALUNS	
Kaufman	\$23
Hy-Gain B.N. 86	\$25

VHF EQUIPMENT

FDK PRODUCTS	
Type-1 2m/FM SSB CW PLL Mobile/Base	\$694
Type-2 2m/FM PLL Mobile Transceiver	\$375
MULTI-PALM 11 2m/FM 6 ch. Pocket Transc.	\$220
MULTI-800 2m/FM PLL 800 ch. Mobile	\$416
MULTI-2700 2m/FM SSB-CW-AM Base Trans.	\$744
Leather Case (for Multi-palm 2)	\$11.50
Battery Charger (Multi-palm 2)	\$9
Crystals (for Multi-palm 2)	\$3

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ICOM IC-701 HF transceiver

ICOM's superior LSI technology takes the lead in Amateur HF. The extremely compact IC-701 delivers 100 watts output from a completely solid state, no tube (broad band design) final, on all modes and all bands, from 160-10M. With single knob frequency selection and built-in dual VFO's, the LSI controlled IC-701 is the choice in computer compatible, multi-mode Amateur HF transceivers.

The IC-701's single frequency control knob puts fully synthesized instant tuning at a single finger tip. WIDE bandwidth, with 100 Hz per division and 5 KHz per turn, is instantly co-ordinated between the smooth turning knob and the synthesizer's digital read-out with positively no time lag or backlash (no waiting for counter to update: less operator fatigue). And at the push of the electronic high speed tuning button, the synthesizer flies through megacycles at 10 KHz per step (500 KHz per turn).

IC225	2m fm synthesised transceiver	330.00
IC280	2m fm remotable cpu controlled	450.00
IC215	2m fm portable incl. 5 channels	245.00
IC402	70cm ssb portable, 3 watts	469.00
IC502	6m ssb portable, 3 watts	239.00
IC202E	2m ssb portable, 3 watts	239.00
IC202S	2m ssb portable, 3 watts	357.00
IC211	2m all-mode ac/dc transceiver	799.00
ICRM3	Remote control unit	169.00
ICSM2	Condenser elect desk mic	45.00
LC-25	Leather case for portables	12.00
FA-1	Rubber ducky for 215/202	12.00
MMB-E	Mobile mount 211/701	22.00
MMB-B	Mobile mount 215/402/202	22.00
RC-20	Nical pack for portables	69.00
CK-28	Remote cable kit IC280 incl cable, case cover, head mount & screws	38.00
MMB-F	Mobile mount IC225	23.00
IC-701	IC701 interface kit for linear	54.00
HC-HP1	ICOM headphones	45.00
IC-CF1	Optional cooling fan for IC701PS	45.00
HM-1	Hand ptt mic, low Z	18.00
IC-511	6m all-mode ac/dc transceiver (coming soon)	

LEADER

LDM-815



Tr Dip Meter

SCOOP PURCHASE!
\$132 now \$124

SPECIFICATIONS

Frequency Range	1.5 to 250MHz with 6 coils
A BAND	
B	1.5 - 4MHz
C	2.3 - 8 MHz
D	6.8 - 18
E	18 - 47
F	40 - 140
G	100 - 250
Modulation	Approx. 2kHz, sine wave
Crystal Oscillator	Uses 1-15MHz crystal unit (supplied)
Semiconductor Complement	2 transistors and 1 diode
Power Supply	9-volt battery, 006P, NEDA or 216, Burgess 216, or equivalent
Current Consumption	2mA, maximum
Size and Weight	175(20) x 65(20) x 50(10)mm; 0.5kg approx.

The computer compatible IC-701 LSI chip provides input of incremental step or digit-by-digit programming data from an external source, such as the microprocessor controlled accessory which will also provide remote band selection and other functions.

Full band coverage of all six HF bands, and continuously variable bandwidth on filter widths for SSB, RTTY, and even SSTV, help to make the IC-701 the very best HF transceiver ever made. IC-701 includes two CW widths, all of this standard at no extra cost.

Sold complete with the high quality electret condenser base mic (SM-2), the IC-701 is loaded with many ICOM quality standard features. Standard in every IC-701 are two independently selectable, digitally synthesized VFO's at no extra cost. Also standard are a double-balanced schottky diode 1st mixer for excellent receiver IMD, and RF speech processor, separate drop time for voice and CW VOX, optionally continuous RTT, fast/slow AGC, efficient IF noise blanker, fast break-in CW, and full metering capability.

Price \$1,380 (AC power supply extra).



STATE OF THE ART TECHNOLOGY

KENWOOD PRICE LIST

TSS205	HF Transceiver 160-10m	700.00
TSS205S	HF deluxe transceiver	1392.00
AT700	Antenna tuner	165.00
SPS20	Matching speaker for TSS205	30.00
SPS20	Matching speaker for TSS205S	65.00
LT1222	Linear amplifier	1365.00
TR7400A	2m fm synthesised	475.00

hy-gain

HYQUAD	10/15/20m, 2 element quad	269.00
240BA	4 el monobander for 20m	249.00
TH6DXK	6 el tribander	299.00
TH3MK3	10/15/20 3 el beam	239.00
TH3JR	10/15/20m 3 el beam	239.00
203BA	3 el beam 20m	189.00

Hustler Antennas

BM-1	Deluxe universal bumper mount	25.00
RM80	80m resonator	30.00
RM40	40m resonator	25.00
RM20	20m resonator	16.50
RM15	15m resonator	16.50
RM10	10m resonator	15.00
MO2	fold-over mast (req'd. for all resonators)	33.00
RSS-2	medium duty spring	13.00

MORSE KEYS

HK702	Deluxe key with marble base	\$41.00
HK708	Economy key	\$23.00
HK706	Operator's key	\$25.00
MK701	Manipulator (side-swiper)	\$45.00
EK1032	Electronic keyer	\$356.00
PALOMAR	IC keyer	\$149.00

BALUNS

BL50A	RAK 50 ohm, 4 Kw model for dipoles	\$32.00
BL70A	RAK 70 ohm, 4 Kw model for dipoles	\$32.00
AS-BL	ASAHI 50 ohm, ideal for beams	\$36.00

TRAP DIPOLES

Midy VNB	80 thru 10m trap dipole, 25m long	\$111.00
AL24DXN	20 thru 40m trap dipole	\$70.00
A4VPN	40m dipole kit	\$27.00

PARABOLIC DISH

PARABOLIC DISH FOR 432 & 1296 MHz
A professionally engineered dish with 12 db and 20 db gain on 70 cm and 1.2 GHz. \$549

RINGO

Price \$49

JAYBEAM

5Y/2m	5el 2m, 7.8dBd gain, length 1.6m	43.00
8Y/2m	8el 2m, 9.5dBd gain, length 2.8m	51.00
10Y/2m	10el 2m, 11.4dBd gain, length 4.4m	84.00
10Y/2m	10el 2m cross yagi, 11.3dBd	84.00
TD70cm	twel 8el, 70cm, 12.3dBd gain, 1.1m	64.00
PBM18/70	18el, 70cm, 14.9dBd gain, length 2.8m	71.00
MBM4870	48el, 70cm, 15.7dBd gain, length 1.3m	83.00
MBM8870	88el, 70cm, 18.5dBd gain, length 3.98m	102.00
PMH/2C	Phasing harness	18.00

Antenna Couplers

CNW217	DAIWA incl SWR/PWR, direct reading, 200w	199.00
CNW417	DAIWA incl SWR/PWR, direct reading, 500w	245.00
MFJ901	Matches every testing 1.8-30 MHz	112.00
MFJ16010	Random wire tuner 160-10m	79.00
MFJ941	160-10m, 300w, incl SWR/PWR	139.00

Rotators

DR7600S	Heavy duty with controller & mast clamps	289.00
DR7500S	Medium duty with controller & mast clamps	199.00
6 CORE	Cable for above (200m rolls)	1500/m

SWR Bridges

VC-2	Twinn meters, 1-150 MHz with cal chart	35.00
SWR200	Oskercob 3-200 MHz, 2/20/200/200w	86.00
SW210A	DAIWA 1.8 thru 150 MHz 20/120w, direct reading	99.00
SW410A	DAIWA 140-500 MHz, direct reading	129.00
SWX777	DAIWA professional 1.8-30 MHz, direct reading	131.00
CN620	DAIWA cross-needle, 1.8-150 MHz, direct reading	99.00

Misc

CS201	COAXIAL SWITCHES (DAIWA) 2 position, high pwr, up to 500 MHz	26.00
CS401	4 position, high pwr, up to 500 MHz	61.00
COAXIAL CHANGE OVER RELAYS (DAIWA)		
CX-2L	1.8 thru 170 MHz, 100w pep max	48.00
CX-2H	1.8 thru 450 MHz, 200w pep max	69.00
FD30M	LOW PASS FILTERS (DAIWA) 12 MHz Fc, 1 Kw, 3 stages, quality	39.00
FD30LS	32 MHz Fc, 200w, 3 stages	20.00

SPEECH COMPRESSORS & PROCESSORS (DAIWA)

RF440	Phasing type processor, ac/dc, 6 db gain	136.00
RF550	Filter type processor, ac/dc, 6 db gain	134.00
MC330	Speech compressor ac/dc	99.00

Plus stacks more!

DEALER ENQUIRIES INVITED

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68 Eastern Road
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Sydney	681.3544
Adelaide	43.7981
Gold Coast	32.2644
Canberra	82.3581
Melbourne	836.8635
Perth	321.3047
Hobart	43.6337
Cairns	54.1035
Launceston	44.3882
Ballarat	32.7234